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EDITORIAL CONTENTS

FEATURE ARTICLES

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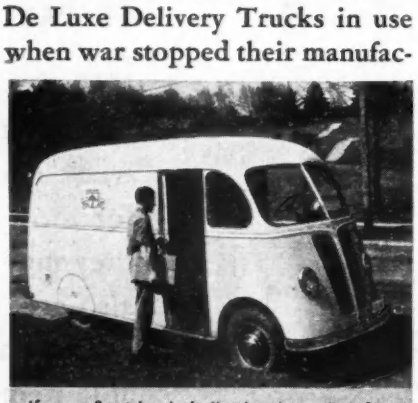

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COMMERCIAL CAR JOURNAL

Vol. LXVII, No. 4 June, 1944

WASHINGTON RUNAROUND

ODT Sole Truck Rationer July 1 . . . M-100 Will Be Revoked . . . Truck Application Boom . . . 1945 Truck Program Cut . . . 238,000 for Civilians in 1945? . . . Plans Depend on Invasion . . . 1944 Civilian Output to be 10% Off . . . Bearing Developments . . . Third Quarter Tire Crisis

by GEORGE T. HOOK

ODT Sole Truck Rationer

As of July 1 the Office of Defense Transportation will have sole charge of the rationing of new trucks. By June 15 the War Production Board's Automotive Division will be relieved of its connection with truck rationing, and by July 1 Interstate Commerce Commission personnel will be replaced by Local Allocations Officers employed by the ODT. Under the new setup, the ODT Allocation Section will have complete charge of handling applications from civilian operators and from Government-exempt agencies, and of the statistical work—such as inventory control—involved in truck rationing. So far as truck operators are concerned, the change should speed up the handling of their applications and should provide all-around efficiency. Eventually it should cost the taxpayers less. The 41 employees occupied with truck rationing in the WPB Automotive Division will be taken over by the ODT Allocation Section. Because many of them were duplicating work done by the ODT, it is very likely that a weeding out process will effect economies. The ODT will choose Local Allocation Officers from among its existing personnel. No expansion is contemplated.

Harmonious Change

The change is being effected with complete harmony prevailing. WPB Automotive Division Director Middlekamp indicated that he saw no reason why WPB should ever have been involved in rationing procedure. He holds the view that WPB's job is production and it is job enough. The Interstate Commerce Commission has been lending its personnel to ODT free of cost. I.C.C. work has undoubtedly suffered and I.C.C. is glad to get squared away to attend to its own highway transportation affairs. The change is one that has been sought from the beginning by the Motor Transport Division of ODT so that agency is thoroughly pleased with the happy event.

M-100 Will Be Revoked

The change in the truck rationing setup will be effected by revocation of Order M-100 and issuance of a new order. No change is expected in application and appeal forms and in the certificate of transfer. When the change becomes effective operators will have 142 ODT district offices at which to file their applications instead of 80 I.C.C. district offices.

Truck Application Boom

With increased truck production there has been a constant increase in the number of applications filed with the ODT Allocation Section. In the first week in January 1400 applications were received. In the week of May 6 over 4200 applications were received. This compares with 900 and 1800 in the same 1943 periods. Approvals average 70 per cent and rejections 10 per cent, with 20 per

(TURN TO NEXT PAGE, PLEASE)

WASHINGTON RUNAROUND

(CONTINUED FROM PAGE 35)

cent being returned for further information. In the case of a carrier requesting additional trucks the Allocation Section now is checking with district offices to see if the carrier is registering freight he cannot carry. No registration, no truck.

1945 Truck Program Cut

When all government agencies had put in their 1945 truck production requirements it was found that the number of trucks requested exceeded manufacturing capacity. The tentative military truck program, patterned after 1944 orders, was held to be so reasonable that ODT was asked to revise its 1945 program calling for 471,000 medium, light-heavy and heavy trucks. Late in May it looked as if ODT would have to content itself with, as a minimum, 170,000 such trucks. There was a possibility that on top of this figure a request might be inserted for light trucks. This would be based on a survey of light truck manufacturing facilities which was being made by WPB. The deadline for completing the 1945 program was shunted from May 1 to July 1. Under current conditions this means that whatever program is arranged will not get started until late in the first quarter of 1945.

238,000 for Civilians in 1945?

If ODT is allotted 170,000 trucks in the program under way, it would mean a total civilian production (on paper) of approximately 238,000 medium, light-heavy and heavy trucks. It figures out this way: Some time ago approval was given for the manufacture of 90,000 such trucks in the first half of 1945. This total has been pared to 83,000, of which ODT's share is in the neighborhood of 68,000. Add to this 170,000 and you have 238,000.

Plans Depend on Invasion

The invasion of the European continent, which may be underway when this item is being read, is the unknown factor that makes paper programs little more than current curiosities. If the invasion goes well and the Army can make use of railroads in the invaded countries, the Army may slash its truck requirements and make cut-back facilities available for civilian production. In such an event the ODT might get the 471,000 units it requested originally, plus a big batch of light trucks. This would mean the end of truck rationing. There would be no need for it. On the other hand, if the invasion goes well and the Army finds itself compelled to use trucks as the chief source of supply, the Army may demand more trucks, and this would be at the expense of civilians.

At Least 25,000 Trailers

This department was unable to extract anything definite on trailer production in 1945. The trailer program will not be considered until the truck program is out of the way. The only prophecy made in official quarters was the obvious one that trailer production in 1945 would be at least as great as the 25,000 programmed for 1944.

'44 Civilian Output off 10%

One last sobering note with regard to truck production is warranted. Of the total military, civilian, etc., truck production scheduled for this year (1944) the official expectation at this moment is that only 75 per cent may be realized. As applied to civilian production alone, the expectation is 90 per cent. This means that instead of 88,000, as programmed, only 79,200 trucks may become available for civilian use.

Bearing Developments

Bearings are still a problem but efforts to solve it continue unabated. Production of the new Ford copper-silver-lead bearing ran into difficulties and the story now is that around July 1 Ford should be producing 100,000 sets per month. Meanwhile, to provide needed Ford bearings another allotment of critical cadmium will be made to certain bearing manufacturers to cover a 90-day manufacturing period. The ODT has uncovered one smelter of secondary cadmium and is checking to see if there are others. If there are, ODT may ask WPB to order the turning in of all used cadmium bearings so that the cadmium may be extracted. This secondary cadmium is said to have all desirable properties. Another bearing development is WPB's extension of its 90 per cent tin by weight amendment to include light trucks. As reported here in February, this was ODT's recommendation.

Engine Rejects for Civilians

It has come to the attention of the ODT that truck engines of one particular make are available to civilians only because of military rejections. It merely points up the tightness of this particular component. There is no insinuation that these rejects are not entirely satisfactory for civilian use. The inspection standards of the Army and Navy are inflexible and if one cylinder out of six varies so much as .001 of an inch from the specification, the engine is rejected.

Tire-Tight Third Quarter

The supply of tires in sizes 8.25-20 ten-ply and up is such that OPA has allotted to ODT only 65 per cent of the quantity requested for the third quarter of this year. ODT considers this quarter an extremely critical period because of the movement of seasonal and perishable farm crops and has filed an appeal for the full 100 per cent originally requested.

Close Shave Department

The railroads are reported to have put all sorts of pressure on Assistant President Jimmy Byrnes to name Union Pacific's Bill Jeffers as director of the ODT succeeding the late Mr. Eastman. The railroads probably figured truck operators would not object to the former rubber director. Byrnes did not budge from his first choice: Brother-in-law Johnson, who had the right of way by virtue of being an Interstate Commerce Commissioner and who, when it comes to forceful personality, concedes nothing to Jeffers.

EDITORIALS

War Department versus Civilian Needs; It's Time for the Truman Committee to Follow Up Its Transportation Report

LAST year, about this same time, the Truman Committee Investigating the National Defense Program undertook to study the parts and truck equipment headaches plaguing motor truck operators.

By Dec. 15 it had issued its report saying:

1. "Immediate action should be taken to insure the earliest possible availability of all necessary replacement parts.

2. "The War Department should be able to reduce the number of trucks allocated to it for production, thus freeing manufacturing facilities for the manufacture of trucks sorely needed by the domestic transport industry.

3. "The War Department should not acquire trucks for non-military purposes unless it is able to operate them with an efficiency comparable to that prevailing in civilian uses.

4. "The committee will follow this matter in order to ascertain the progress being made by the War Department in improving the efficiency of utilization of its present inventory of trucks in noncombat areas.

5. "The motor vehicle is woven into our national life to such a degree, and in such manner, that diminution in the service rendered by motor transport will necessarily have serious repercussions on our war effort."

Well, the headaches are still with us and all because the War Department continues to do as it right well pleases. The question therefore arises: Isn't it time for the Truman Committee to pick up where it left off last December and find out who in the War Department pursues an uncompromising course while the War Department itself pays lip service to the "need of these trucks (and these parts) for civilian transportation essential to the war program"?

Ask other government agencies concerned with civilian transportation requirements and they'll tell you that to them it looks as if the War Department were continuing to order excessively. Ask manufacturers who are building parts, trucks and shop equipment for the War Department and they'll voice the same suspicion.

But it is all suspicion. The Truman Committee reported that "the War Department had indicated its willingness to make available to the committee privately a detailed justification of this (the very large 1944) program." Did the Truman Committee receive the War Department's statement? . . . and did it justify keeping civilian motor transport precariously out on a limb? The committee ought to find out.

Who in the War Department went along with the Automotive Division of WPB and with the Motor Transport Division of ODT on the unqualified reservation of 5 per cent of the facilities manufacturing the most critically needed replacement parts? And who in the War Department at the last moment made this amendment to parts order L-158 a hollow mockery by insisting upon the insertion of a phrase that would permit the 5 per cent reservation if it did not interfere with military production? The committee might ask if he was so stupid as not to know that the very purpose of the amendment was to interfere with military production to the extent of a pauper's 5 per cent? If he knew it and ignored it, the committee ought to inquire into the reasons for his low opinion of the needs of motor transport.

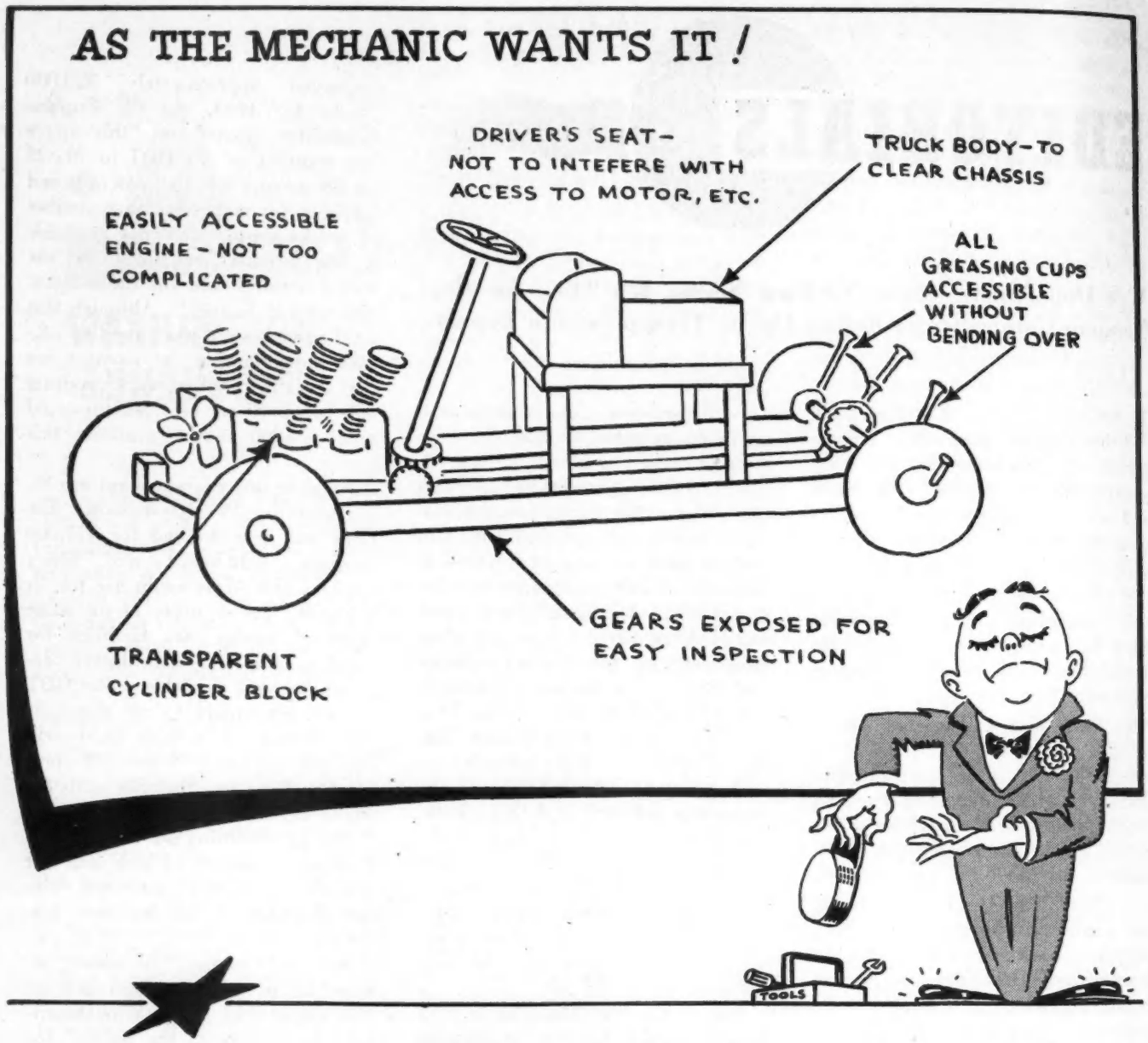
Back in 1943 when plans for this year were being made, the ODT requested approximately 320,000 trucks for 1944. As the Truman Committee pointed out "this figure was reduced by the ODT to 79.625 on the ground that the materials and facilities for more than that number of trucks simply were not available if the amounts requested by the armed services and the other agencies were to be met." Although this total subsequently was raised to 88,000, indications at the moment are that the 1944 civilian truck program will be off 10 per cent, which would make 79,200 trucks available this year.

Right at this moment plans are being made for 1945 production. The ODT put in a demand for 471,000 medium, light-heavy and heavy trucks. The Army again has put in a demand for so many of the same types of trucks that facilities for building both ODT and military programs are not available. The ODT has got its orders to cut down its requirements. As matters stand civilians will be lucky if the 1945 program when set includes 170,000 trucks earmarked for the ODT.

This is something not only for the Truman Committee to look into but also the committee concerned with the disposal of surplus war materials.

As the Truman Committee asserted in its transportation report an "obligation rests on the War Department to account to the public" for its requests. General Highandmighty knows right well that when the war is won he may be censured for winding up with an outrageously excessive amount of military equipment; but he's not likely to suffer for it. He's not going to be shot, and it's just as unlikely that anyone would benefit if he were jailed. The question naturally arises: Is this knowledge being abused?

The Truman Committee is the only body in position to get all the answers. Those who raise the questions have as little desire to impede speedy prosecution of the war as the committee. But the War Department must be made to realize that if it continues to look down its nose at the needs of civilian motor transport, its own uncompromising prosecution of the war contains the seeds of serious impediment.

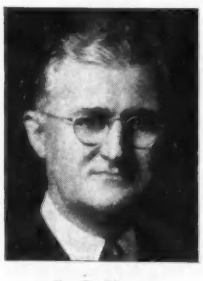


What Mechanics Want

A serious discussion of the changes which maintenance men would like to see in commercial vehicles of the future to ease repairs and reduce costs

by C. F. HAWES

Traffic Manager, Dairymen's League Cooperative Assn., Inc., New York City

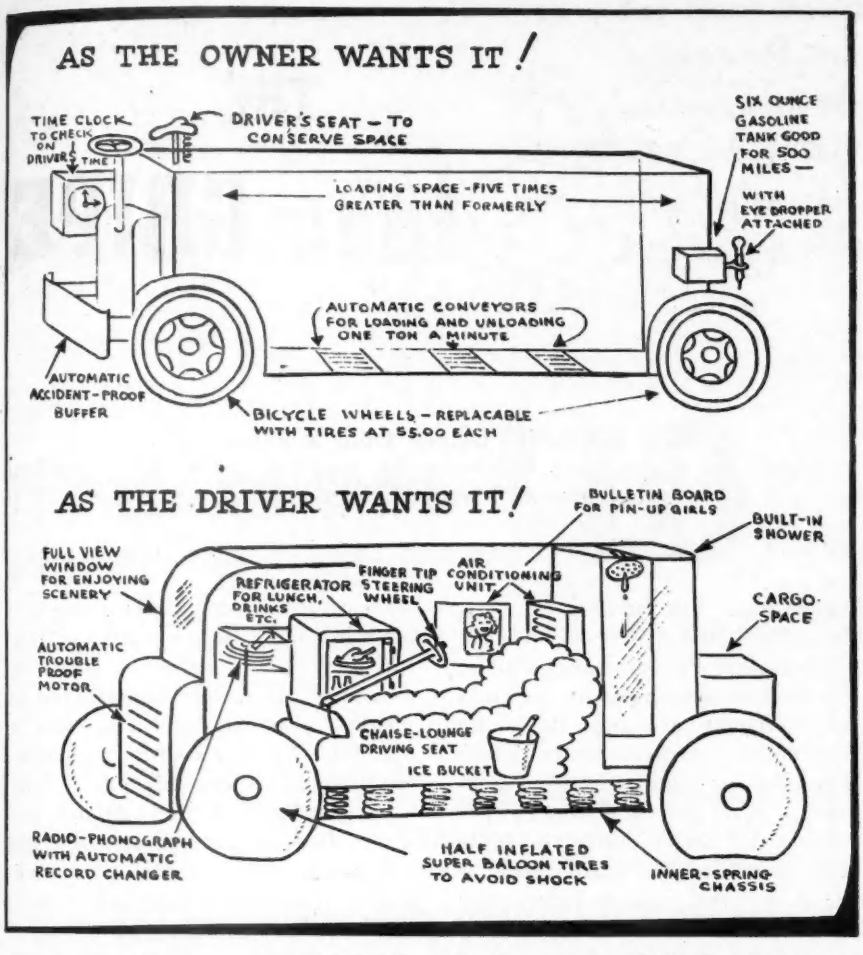


C. F. Hawes

From a paper presented at a meeting of the New York Metropolitan Section of the S.A.E.

ONE thing is certain: You cannot discuss maintenance without an appreciation of the human equation. Until engineers produce a vehicle in which all moving parts are encased in sealed containers with automatic lubricating devices or constant oil baths and faultless tell-tale danger signals, the reactions of the men who keep the parts functioning properly must receive consideration.

What manufacturer can produce



The above sketches are published through the courtesy of Mack Trucks, Inc. They are an artist's humorous aside to the serious discussions of post-war truck design. The article below is a serious approach to post-war design from the point of view of the men who service and repair trucks

in Post-War Trucks

evidence that anywhere near as much money and effort has been expended finding out how his vehicle is handled by the maintenance mechanic as has been spent on cost-saving production methods? Any maintenance man will tell you that if these wizards of production would give maintenance the same kind of intelligent consideration, his life would be made much less complicated, his vocabulary less vitriolic and the first-aid kit much less in evidence.

The suggestions contained in this paper have not come from the front office. They all emanated from maintenance men, many of whom feel that their problems have been ignored by the designing engineers.

Human nature being what it is, we must consider it axiomatic that the more difficult a task, the less often and less thoroughly it will be done. Conversely, the easiest part to get at or the one most conveniently located gets the attention.

A frequent difficulty is that someone designs a chassis, then an artist, with no conception of maintaining that chassis, designs a streamlined body. A game of hide and seek has been set up for the maintenance force.

The truck looks good, is fairly priced so it sells, and when it first goes on the road, it makes attractive advertising for the owner. But what of those behind the scenes, the mechanics and those responsible for the operating cost extending over the life of the vehicle?

I repeat, too little attention has been given by the manufacturer to what goes on in the operator's shop. For instance, parts are made extra heavy for long life. Can the manufacturer tell you what percentage of the life built into a part represents wear caused by *work* and what percentage is built into it to counteract wear caused by *neglect?*

To what degree is the manufacturer responsible for wear caused by neglect? Confining our attention to the human equation, we make the observation, he is responsible to the degree that he has made moving parts unnecessarily difficult to reach. Theoretically, properly adjusted parts having correct and adequate lubrication never wear out. The easier it is to maintain that condition, the more satisfactorily will the truck perform.

To mention a few of the changes the service man would like to see:

LUBRICANT—Greasing points reduced to a minimum. Locations of grease connections accessible from an upright position, where possible, and in all instances free from obstruction. Kinds and grades of lubricants reduced and standardized. All moving parts, requiring grease, to be sealed so that the lubricant need be replaced not more frequently than once in 10,000 miles, or once a month.

COOLING SYSTEM—Many suggestions appear in regard to the cooling system. Either a surge tank or sealed system seems universally desired. Also, a petcock is being used to a limited extent for the purpose of indicating volume and from which to obtain samples of the coolant. Most mechanics perceive in the lack of proper thermal control and inadequate cooling systems, the cause of many mechanical failures which result in avoidable labor and expense.

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WHAT MECHANICS WANT IN TRUCKS

(CONTINUED FROM PAGE 39)

One difficulty often mentioned has to do with the lower radiator hose clamps. Frequently, these are located in a position requiring a universal joint arm to tighten them.

Mechanics also recognize the desirability of adequate and uniform cooling of the engine and, as trucks get older, the cooling system will get clogged. Although various cleaning compounds are available, the most satisfactory method is to scrape out the rust, dirt and sediment. In order that this may be done properly, it is recommended that a large inspection plate be provided on the side of the motor block, one through which all water jackets could be reached, assuming, of course, that such an inspection plate is susceptible of being properly and readily sealed. This has been done in the past but, due to the failure of engineers to design a positive seal or gasket, many have discarded a good idea.

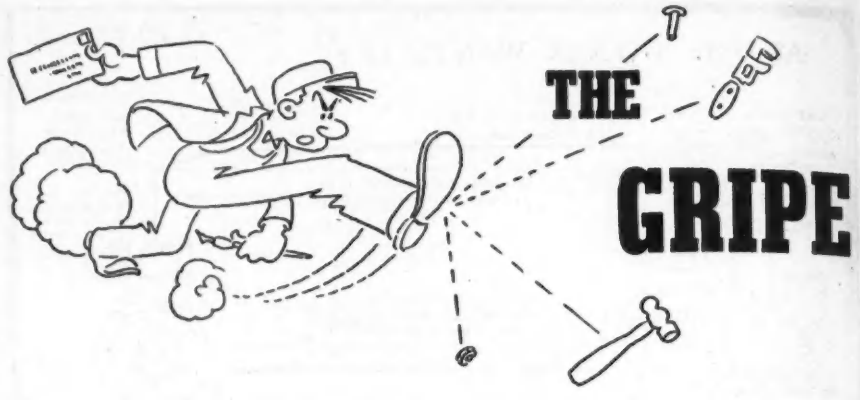
There is need for an automatic control of air flow in cold climates. It is, therefore, suggested that the winterfront should be standard equipment in such climates and that the louvers be made horizontal—fully automatic—and that these automatic louvers be made to open progressively from top to bottom.

Another suggestion is that the radiator be placed in the rear of the engine. Improvements in insulation and ventilation have removed some of the objections to locating the radiator immediately in front of the cab, and this change would enable mechanics to approach the front and side of the engine unhampered, thus materially speeding up their work. Also, many times a relatively slight blow, which would not affect a vital part of the engine, damages or destroys the radiator in its present location. With the radiator in the rear, more space is provided for hanging accessories on the engine in accessible locations.

ENGINES—For a really efficient preventive maintenance program, all engines should be equipped with a tachometer with a totalizer showing the number of revolutions and a maximum hand showing highest speed, which can only be released with a special key. At present the life of an engine is given in truck miles which is not a true figure, due to idling time and the use of gears. It is difficult to estimate the number of miles a truck travels in each speed.

Grinding valves takes too many hours for a maintenance operation that has to be done so frequently. Satisfactory equipment has been provided for the actual work of grinding and reseating, but the complaint is directed at the time consumed getting the valves out and replacing them.

REAR CAMSHAFT COVER—Oil leaks are frequently found around the rear camshaft cover. On some makes of engines it takes as much as 8 hrs. to reach about a half dozen screws on camshaft rear bearing cover plates. A little thoughtful designing should produce a sealed cap or cover which would not need attention between major overhaul jobs.



"Why Not Invite 'Gripes' from Mechanics . . . . . and see if you can't influence the post-war trucks for simplified maintenance?" writes Fleetman Dudley

COMMERCIAL CAR JOURNAL,
Philadelphia, Pa.
Gentlemen:

Gooseneck filler pipes on gas tanks and radiators are fine items for streamlining, but waste many gallons of gasoline and anti-freeze from overflowing. Also, prevent testing of anti-freeze until the radiator is filled. Then, of course, the engine must be run to mix the contents before testing. If anti-freeze is needed, some of the contents must be drawn off to make room for it. Frequently the drain cock is directly above the front axle, so the liquid goes on the floor, which is wasteful and untidy.

Drain cocks with a straight-through passage can be cleared of sediment with a piece of wire, but the more common type in use in late years can be cleared only by a blast of compressed air, or by complete removal. In the latter case, of course, the radiator must be drained, partly on the floor.

On one type of truck in our fleet it is a three-hour job to remove and replace a radiator. Slight changes in design could reduce the time by two-thirds. Some radiators must be loosened and moved forward just to instal a new fan belt. Too close to the fan. Another half-inch of clearance would cut the job time in half.

Beginning with the radiator and continuing to the rear axle, I could fill pages with instances of maintenance operations made much more difficult than necessary by the truck manufacturers' complete indifference to the problems of the mechanic.

Nobody cares for the mechanic's convenience, but his boss pays in hard cash for his inconvenience.

Units difficult to repair are either poorly repaired or not repaired soon enough.

Why not invite "gripes" from mechanics, and see if you can't influence the post-war trucks for simplified maintenance?

Very truly yours,
F. G. DUDLEY,
Hoague-Sprague Corp.,
Lynn, Mass.

Department

For Fleet Mechanics, Shop Foremen, Superintendents, Supervisors — in fact all men connected with the maintenance of truck fleets, who want designers of post-war trucks to give more thought to making those trucks easier, less expensive to maintain and repair

IT PAYS TO GRIPE

COMMERCIAL CAR JOURNAL WILL PAY $10 FOR EVERY GRIPE PUBLISHED . . .

. . . AND each month one of the Gripes will receive an extra award of a $25 WAR BOND

. . . READ fleetman Dudley's letter in the adjoining column and you'll get a clear idea of what this is all about

No sooner said than done. Fleet Mechanic Dudley's suggestion is timely. COMMERCIAL CAR JOURNAL herewith inaugurates "The Gripe Department" and invites fleet mechanics and all others connected with fleet maintenance to send in their gripes. And it will pay to gripe. For every griping letter published in this department, COMMERCIAL CAR JOURNAL will pay $10. In addition, the best letter each month will receive a $25 War Bond. The choice of letters for publication and for the War Bond will be made by the Editors of COMMERCIAL CAR JOURNAL. Their disposition of letters will be final. Choice will be determined by the content of the letters and not by style of writing or appearance.

Here is a chance for every fleetman to tell the designers of post-war trucks what is wrong with trucks as they have been built and how post-war trucks should be designed to cut down maintenance time and maintenance costs.

Here is every fleetman's chance to get his ideas over to all of the big shots in the truck industry: presidents, sales managers, engineers and service managers.

Here is an opportunity for fleetmen to influence post-war truck design along lines that will make their jobs easier and more pleasant.

Fleet mechanics, fleet shop foremen, fleet superintendents and fleet supervisors—in fact all men connected with the maintenance of truck fleets—are invited to send in their gripes.

Address your letter to THE GRIPE DEPARTMENT, COMMERCIAL CAR JOURNAL, PHILA., 39, PA.

The welsh plug is not satisfactory as it becomes loose and leaks.

CRANKCASE — Oil leaks between the upper crankcase and oil pan at the rear main bearing are a source of frequent annoyance. Our thought is that the crankcase can be sealed to positively prevent such leaks. Suggestions have been made to construct the oil pan so that it can be removed without jacking up the front of the motor and removing the tie rod.

BEARINGS — It is reported that longer life is obtained from poured bearings than from shell bearings. Without debating the merits of shell bearings versus poured bearings, experience with shell bearings indicates that the graduation is too great between sizes.

Sizes available do not accommodate enough of the conditions met with in repair replacements. With the sizes obtainable, it happens in too many instances that when the bearing is seated under pressure, the bearing surface seizes or has tight spots, causing unnecessarily rapid wear, with consequent short bearing life.

While it is recognized that replacement of shell bearings can be accomplished in one quarter of the time required for poured bearings, this very definite saving cannot be fully taken advantage of because of this lack of a sufficient number of sizes.

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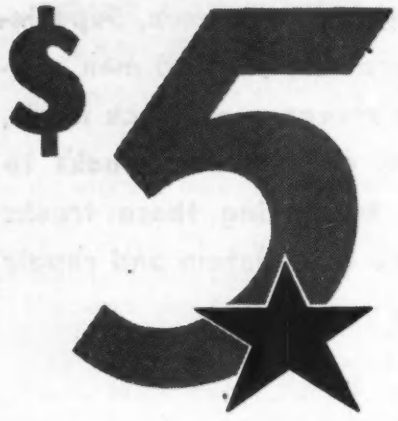
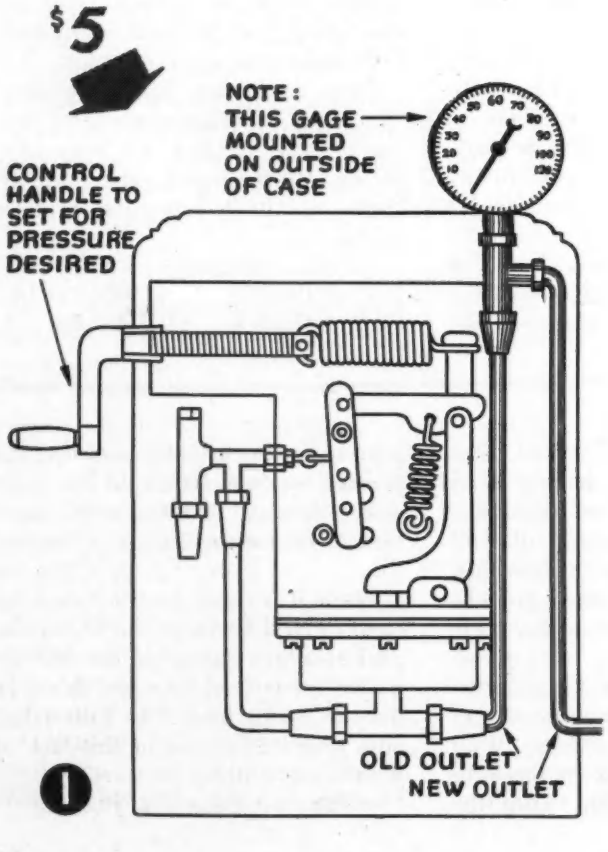
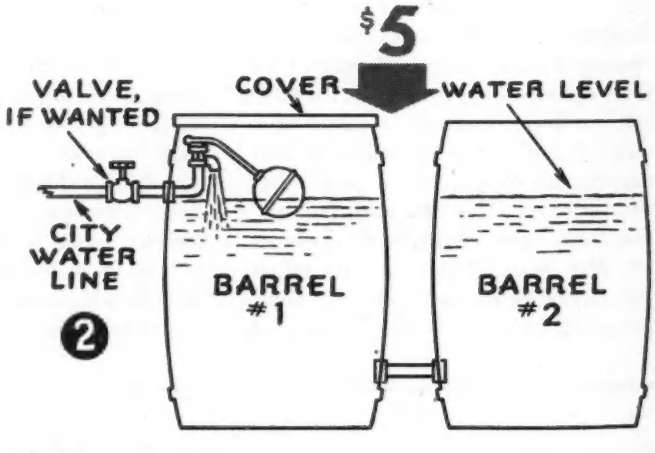


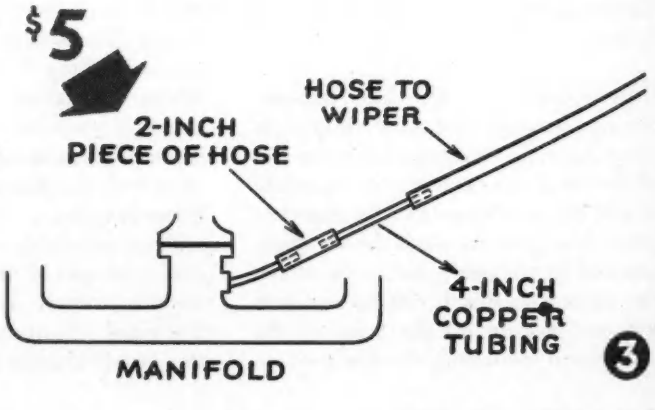
Commercial Car Journal will pay $5.00 for acceptable shop hints and $5.00 for unusual parts salvage tips. Send in as many ideas as you have to the editor. Don't underestimate your ideas. Let the editor be the judge. A photograph or a rough sketch and simple explanation in your own words are enough. CCJ will polish them up for publication. Use this opportunity to earn extra money to buy more War Bonds to "Back the Attack."

Four pages of Shop & Salvage Hints are published in this issue on these and succeeding pages, as follows:

SHOP & SALVAGE HINTS







1. Pressure Gage Check

by C. F. William Altvater
Consolidated Gas, Electric Light and Power Co.
Baltimore, Md.

We have experienced considerable trouble with automatic air stations, used for tire inflation, losing their calibration. As a result, tires may have been over- or under-inflated.

Under present conditions, necessitating extra care in tire conservation, proper inflation has become important. The accuracy of the automatic gage can be checked at regular intervals (daily or as often as required) by installing a regular hand pressure gage on the outside of the air tower housing, simply by making the connections shown in the accompanying drawing.

If the nozzle at the end of the air hose is held on the tire valve momentarily, after the tire is inflated to the setting on the automatic gage, the actual pressure will be shown on the secondary gage.

2. Automatic Water Supply

by T. J. Hourihan
Moulton & Holmes, Roxbury, Mass.

Instead of having drivers waiting in line at the water faucet to fill the water cans to bring their radiators up to level, I constructed the barrels with an automatic water supply valve shown in the accompanying sketch. This has been very successful in that water cans are filled almost instantaneously, time lost by the drivers waiting in line has been considerably reduced, and our water bills have been cut practically in half.

Construction was simple. I simply took two good oak barrels and drilled a hole in each, six or eight in. from the bottom, to accommodate a 1¼-in. pipe connection, as shown in the drawing.

Up near the top of barrel No. 1, I drilled a ¾-in. hole to admit a pipe from the city water supply. At the end of this pipe, inside the barrel. I installed an ordinary toilet ball cock shut-off fixture.

When the water was turned on, both barrels filled to the same level and shut off automatically when the maximum level was reached. Now, water cans are dipped into barrel No. 2 and filled without delay.

A cover was installed on barrel No. 1 to prevent the possibility of damage to the ball float. A shut-off valve may be installed just outside of the barrel, but it isn't necessary.

With this device, several drivers can fill their cans in the time formerly required by just one man.

3. Wiper Hose Repair

by Frank E. Seftcheck
Swift & Co., Brooklyn, N. Y.

When the windshield wiper hose collapses at the manifold end, the wiper becomes inoperative. The usual procedure is to cut off the collapsed section—from 1½ to 2 in.—and re-install.

However, in due time, that end will collapse again. After the second cut,

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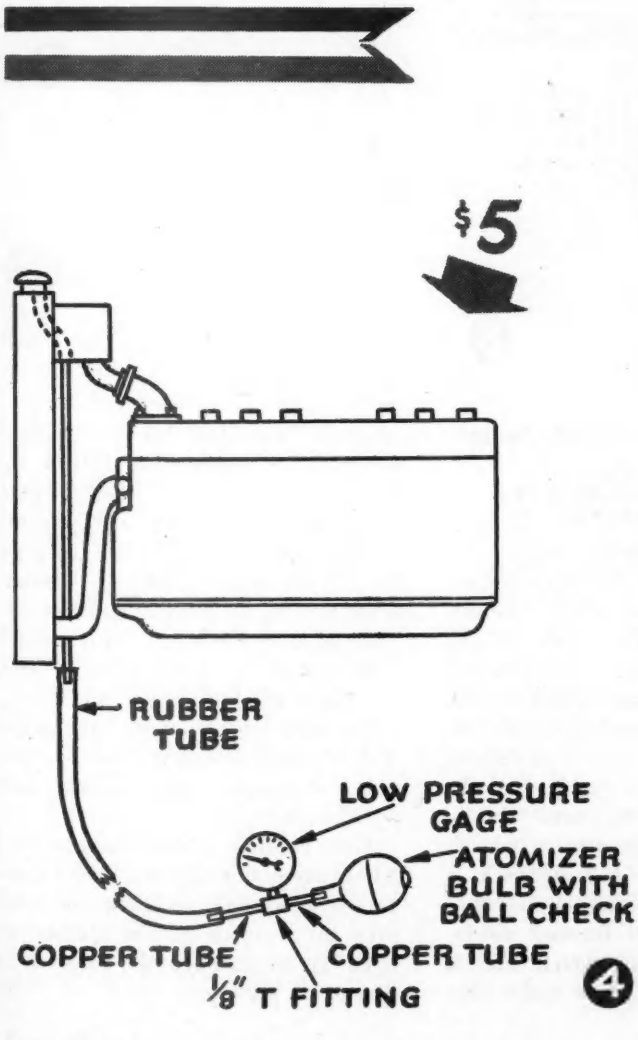

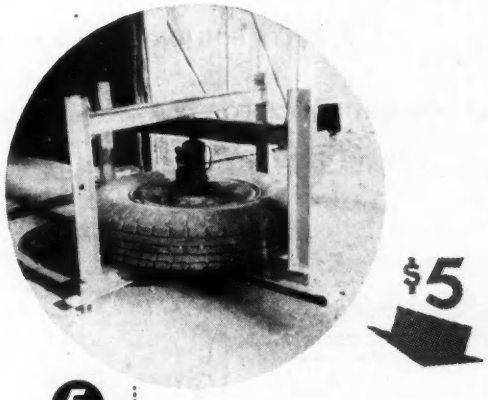

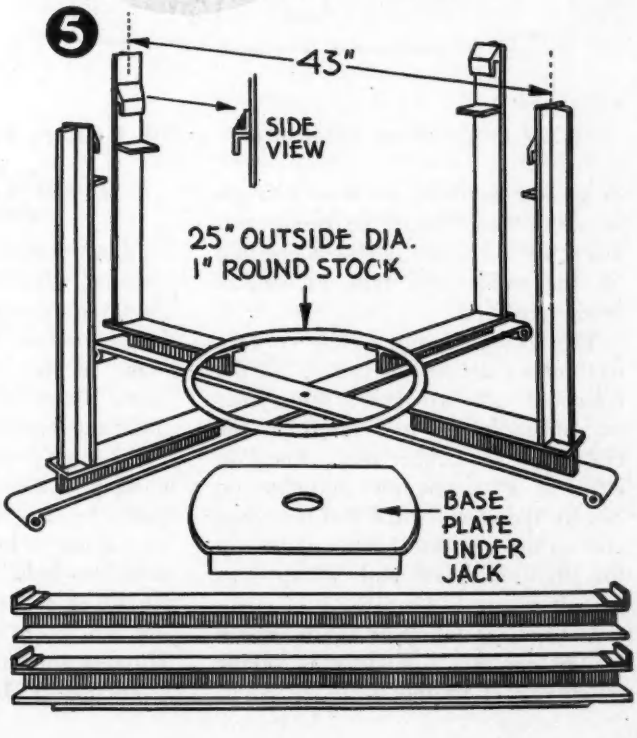

Commercial Car Journal will pay $5.00 for acceptable shop hints and $5.00 for unusual parts salvage tips. Send in as many ideas as you have to the editor. Don't underestimate your ideas. Let the editor be the judge. A photograph or a rough sketch and simple explanation in your own words are enough. CCJ will polish them up for publication. Use this opportunity to earn extra money to buy more War Bonds to "Back the Attack."

SHOP & SALVAGE HINTS

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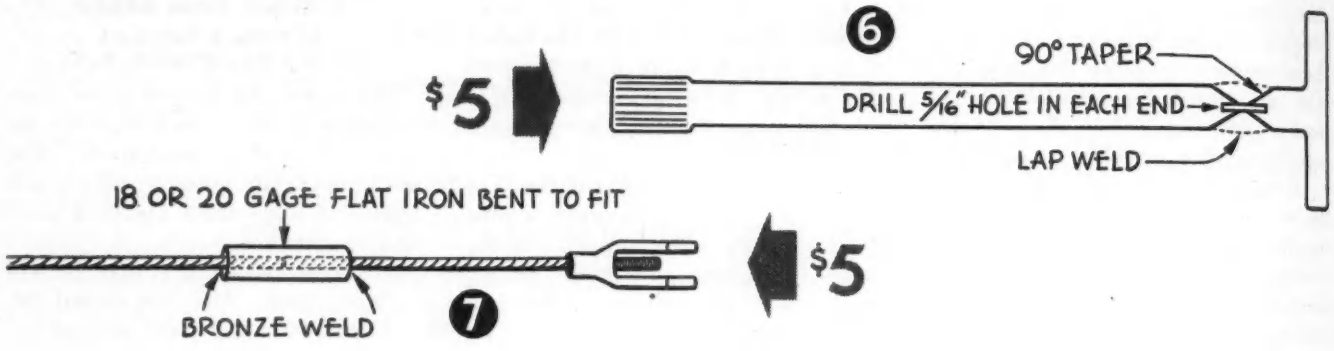
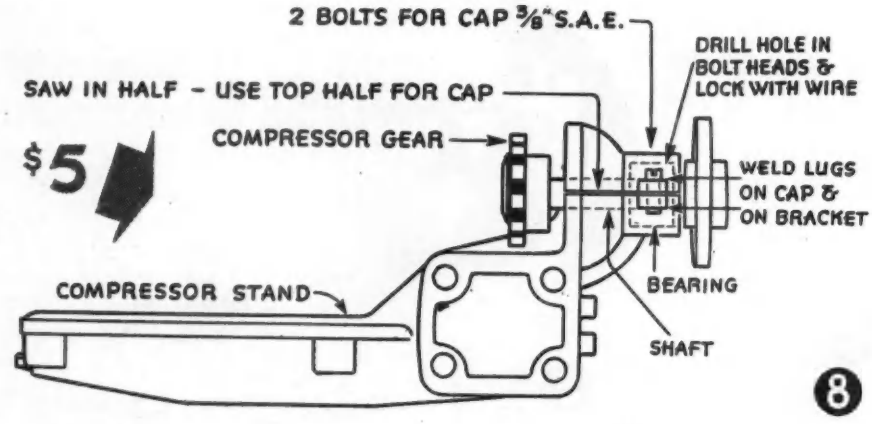
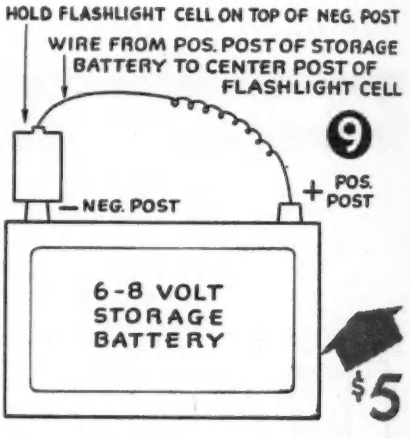






(CONTINUED FROM PAGE 43)

or at most the third, the hose becomes so short that it must be replaced—about 24 in., more or less depending on the make and type of vehicle being repaired.

The accompanying sketch shows a method we use. After cutting off the collapsed end, we take a 4-in. piece of copper tubing and insert in the cut end of the rubber tube. Then we cut 2 in. off a new hose and slip one end on the copper tube and the other end on the manifold. This makes up for the collapsed end which was cut off.

If the hose collapses again, all we replace is the 2-in. length, saving much rubber tubing.

4. Cooling System Leak Tester

by B. H. Eaton
The Bell Telephone Co. of Pa.
Pittsburgh, Pa.

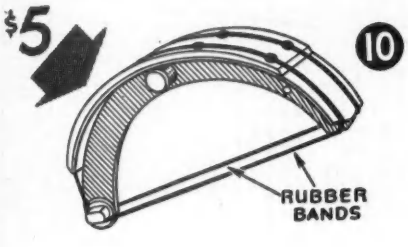
Most coolant leaks are readily discovered. However, where heaters are used, drivers often complain of anti-freeze odors. These are caused by leaks in the heater or the spongy hose, where it comes through the dash and where vibration is greatest.

An inexpensive but satisfactory cooling system leak tester can be made by any fleet mechanic simply by taking a low pressure gage, an atomizer bulb with a ball check, a length of rubber tubing, copper tubing, an 1/8-in. T fitting, and assembling as shown in the sketch, Fig. 4.

To use the tester, first make sure that the radiator cap is air-tight, then slip the rubber tubing over the end of the radiator overflow pipe. Next, work the bulb until a pressure of four lb. is indicated on the gage. If the pressure holds, the cooling system is tight. If the hand on the gage drops toward zero, it indicates a leak and the coolant will ooze from the point which leaks.

Periodic checks with this device will insure a leak-proof cooling system and, in the winter months, save anti-freeze.

One caution should be exercised when using this device: Avoid pressure over four lb., as higher pressure may force seams in the radiator to open up or damage the packing in the water pump.



5. Hydraulic Tire Remover

by Claire E. Ellsworth
Ellsworth Sales Co., Eagle Grove, Iowa

After struggling, off and on for almost a week, to remove two tires that froze—permanently, it seemed—to their rims, I decided to build a power press for removing tires.

Using scrap material, I built a frame of 3-in. T-beams resting on two discarded 3x7/16-in. spring leaves, as shown in the accompanying sketch, electric welding all the joints. It accommodates rims of 20 in. and up, the tires up to 11.00x20.

To use the press, I place the tire in the frame so that the rim fits inside the ring. Then, after removing the lock ring, I position the base plate, which fits loosely inside of the tire bead. On the base, which is strongly braced underneath, I stand a 12-ton hydraulic jack. Then I take the two cross bars, which are 2¼x3x⅛-in. I-beams, and place them on their respective brackets above which are inverted angles, welded to the uprights, which serve as stops to hold the cross bars firm as the jack head moves up. The lower I-beam has a 3x7/16-in. spring leaf to brace it.

6. Axle Shaft Repair

by Jacob J. DeGraff
Parchment Automotive Service, Parchment, Mich.

We have a method of repairing broken axle shafts that is both accurate and durable.

We align the two pieces in a lathe and turn the ends to a 45 deg. taper. The points are cut off just enough to drill a 5/16-in. hole about one in. deep. Into this we insert a piece of 5/16-in. cold rolled steel insert, and electric lap weld the joint.

The advantage of the steel insert is that, not only does it keep the shaft in alignment, but it makes a better job, by assuring the same length of shaft after the repair is made, and giving the welder something to build up on if it is necessary to cut away much of the fractured section.

The first repair we made of this kind was made seven years ago and that shaft still is in service. At that time, a new shaft would have cost us $44. It took us about 2½ hours to make the repair, making a worth while saving.

7. Brake Cable Repair

by A. C. Leer
Musser's Bakery, Somerset, Pa.

Sometimes when brake cables are in service for a long time, they become so stretched that it becomes impossible to make the regular adjustments. We have found an effective means of shortening such cables so that they can remain in service for a long time.

We select the most suitable part of the cable to cut out a section that will bring the cable to the desired length. We butt the ends together and join with a sleeve, which we make from a piece of 18 or 20-gage flat iron bent around the cable at the splice, which is bronze welded with an oxy-acetelene torch. A slight gap should be allowed in the center of the splice to permit the bronze to enter and assure a strong weld.

8. Compressor Bearing Replacement

by Arthur E. Peterson
Gulf Refining Co., Louisville, Ky.

To replace the greaseless bearing on the pulley shaft of the air compressor used on the model WA-22 White trucks requires the removal of the compressor, compressor bracket, pressing off the chain gear and pulley hub, before access to the bearing is possible. Usually this is about a four-hour job.

I have found a way to simplify this bearing replacement by sawing the shaft housing horizontally, so that the part cut off becomes a cap over the pulley shaft, as shown in the accompanying drawing. Then I brazed two 7/16-in. SAE nuts on each side of the cap, and two ⅜-in. SAE nuts on the lower part of the housing. Then by using two ⅜ SAE, 1½-in. cap screws, I fastened the cap to the housing. Also, I drilled a small hole in the head of each bolt to permit wire locking.

All that future compressor bearing replacements require is to disconnect the chain, remove the cap, raise the shaft, remove chain gear and pulley, replace bearing, replace pulley and chain gear, replace shaft and recap the housing—about a 45-minute job.

9. Dry Cell Recharger

by T. J. Hourihan
Moulton & Holmes, Roxbury, Mass.

When your flashlight batteries run down and replacements are not immediately available, try this stunt.

Place the bottom of the dry cell on top of the negative post of a six-volt storage battery, and run a wire from the positive post of the storage battery to the center post of the flashlight battery. Hold in that position until you feel the dry cell become warm, then remove. Repeat this operation with each cell and reassemble the cells in the flashlight case. You will find the light as good as new.

10. Brake Lining Rivet Holder

by Budd Shaulis
Continental Baking Co., Norristown, Pa.

This is a very simple stunt, but it saves about half the time normally required for installing drilled and countersunk brake lining.

After removing the old lining, place the new piece over the brake shoe, insert all rivets by hand, then take two rubber bands (they can be cut off old inner tubes), and stretch them from one edge of the shoe to the other, centering them over the rivet heads. This will keep the rivets from dropping out when the shoe is turned over for riveting.

By allowing the edge of the lining slide over the brake machine anvil, the rubber band will be pushed back at the rivet head and the anvil will drop freely into the countersunk hole.

In addition to speeding up the job, this stunt helps do a better job because, when the rivets are loose, it is possible to shift the lining so that all rivet holes line up properly.

In this article the author takes up the effect of wartime operation on operating costs. He cites his own fleet's accurate figures to show how maintenance costs have increased in the case of light trucks and passenger cars which he operates.

The rubber conservation program has had quite an effect on tire costs, he points out. In 1941 his tire cost per mile was 17 cents. This moved to 20 cents per mile in 1942 and jumped to 36 cents per mile in 1943. He attributes the latter to "the extravagant economy of extensive repairs and present grade materials."

Another figure that he cites shows the effect of 2 years of wartime operation on total operating costs per mile. This cost has increased 25 per cent from 1941 to 1943. Says the author: "Since during this same period mileage has decreased approximately 24 per cent, I am unable to tell exactly what part of the increase results from increased costs of operation and maintenance and what part of the increase results from reduced mileage. I would estimate that approximately 17 per cent is due to increased cost and 8 per cent due to reduced mileage."

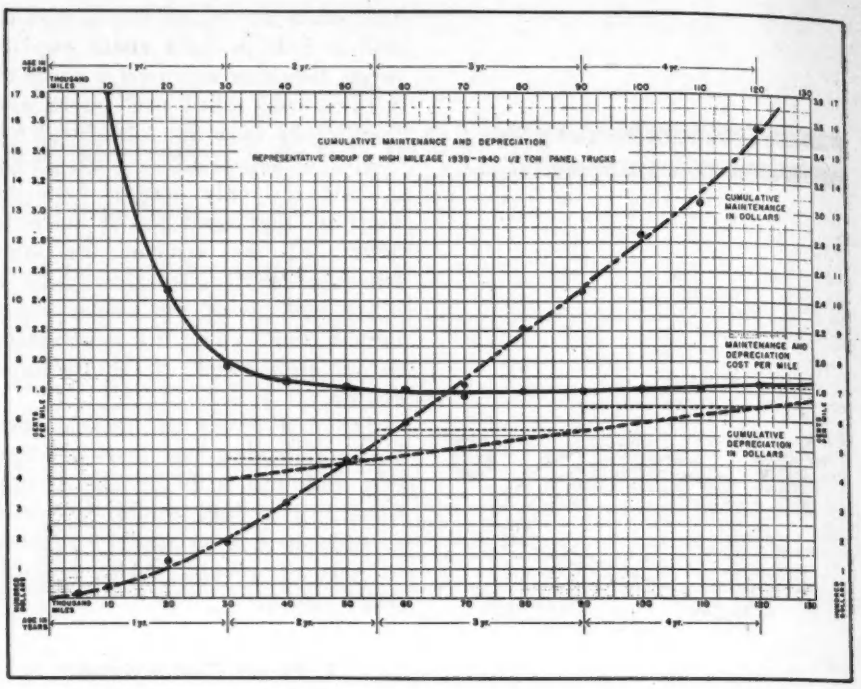


Fig. 1. This graph charts the cumulative maintenance and depreciation costs for a representative group of ½-ton panel trucks during the war period. An explanation of the higher cost of wartime operation is given in the article

Wartime Costs of Fleet Operation

S. G. Page

THE inability to buy replacement trucks has required the operation of many pieces of equipment considerably past what was previously considered the desirable trade-in point. This extended vehicle life provides us with a check on the theory covering the most economical trade-in point of a vehicle. It also gives us some idea of what it has cost us to run this additional mileage on a vehicle that would under normal conditions have been disposed of. I am speaking primarily with reference to light equipment, such as half-ton trucks and passenger cars, since we have very few heavier pieces of equipment that are far enough past their replacement point to allow the same comparisons.

Our past practice has been to replace passenger cars between 40,000 and 60,000 miles depending upon the rate at which they have developed their mileage, and this was generally from 2½ to 4 years. We believe the most economical trade-in point for the low mileage half-ton trucks is between 30,000 and 40,000 miles when developed in about 3 years or at the rate of 10,000 miles per year. For the higher mileage half-tons, vehicles that run from 20,000 to 30,000 miles per year, depending on types and cost, the most economical trade-in point is between 40,000 and 70,000 miles, and at an age of about 2 years. The average trade-in for the high mileage group would be around 60,000 miles.

With this as a general basis of past practice, we are in a position to check these groups, now that we have a number of half-tons that have run over 100,000 miles and many passenger cars that are pretty well

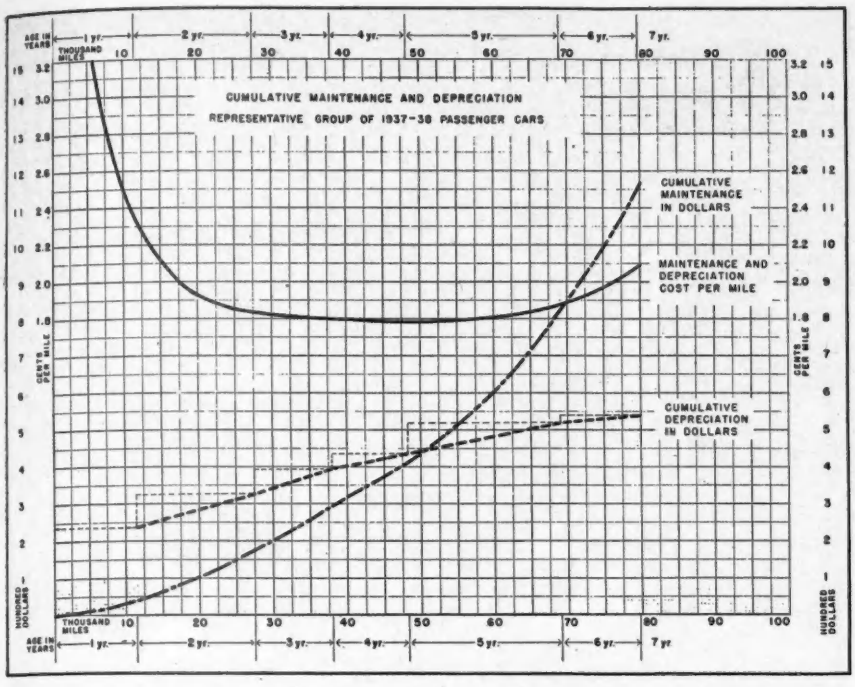


Fig. 2. This graph concerns itself with a representative group of 1937-38 passenger cars and charts cumulative maintenance and depreciation costs. The accompanying article explains in detail the higher cost of wartime operation

Continued use of vehicles past desirable trade-in point jumped this fleet's maintenance cost 12 per cent. Tire cost up 100 per cent and total operating cost 25

by S. G. PAGE

General Superintendent, Equitable Auto Co., Pittsburgh, Pa.

along towards 80,000 miles. This check was made by averaging maintenance costs for a representative number of vehicles in each group and plotting this cost against mileage. Depreciation also is plotted against mileage, and the most economical trade-in point is the mileage at which the lowest cost is obtained for both maintenance and depreciation. This point is approximately where the accumulated maintenance cost curve crosses the accumulated depreciation cost and is definitely influenced by any appreciable change in rate of maintenance. Curves for the two groups are in Figs. 1 and 2.

Of course, this isn't offered as an infallible rule because the variables that can be imposed in a depreciation policy, when the market for used vehicles is either increasing or decreasing in values, will alter your conclusions, as will the maintenance policy under which you operate. The depreciation figures used are from our experience of values under normal times. The curves of a group of vehicles are, of course, smoother than for individual vehicles. The pattern of the curves from this study is generally the same for the various groups that I have checked, so I will quote only one example for half-ton truck and one for passenger car groups.

A group of half-ton panels at the end of 70,000 miles cost us 1.76 cents per mile for maintenance and depreciation. The maintenance and depreciation cost per mile is generally flat out to 120,000 miles, where it reaches 1.85 cents. This increase of .09 cent per mile over 120,000 miles has cost us $108 above average costs.

Assuming 70,000 miles as the most economical trade-in point, we have run 50,000 miles beyond that point at an increased cost of $108 or .22 cent per mile. Adding .22 cent per mile to our most economical cost of 1.76 cents per mile is an increase of approximately 12.5 per cent.

At 70,000 miles our maintenance cost per mile was 1.05 cents and depreciation .71 cent, while at 120,000 miles maintenance cost per mile increased to 1.31 cents and depreciation decreased to .54 cent. In this case the decreased depreciation cost has offset the increase in maintenance cost except for the .09 cent. In this group of vehicles the additional mileage was developed in approximately 1½ years. Their average cost was $892.

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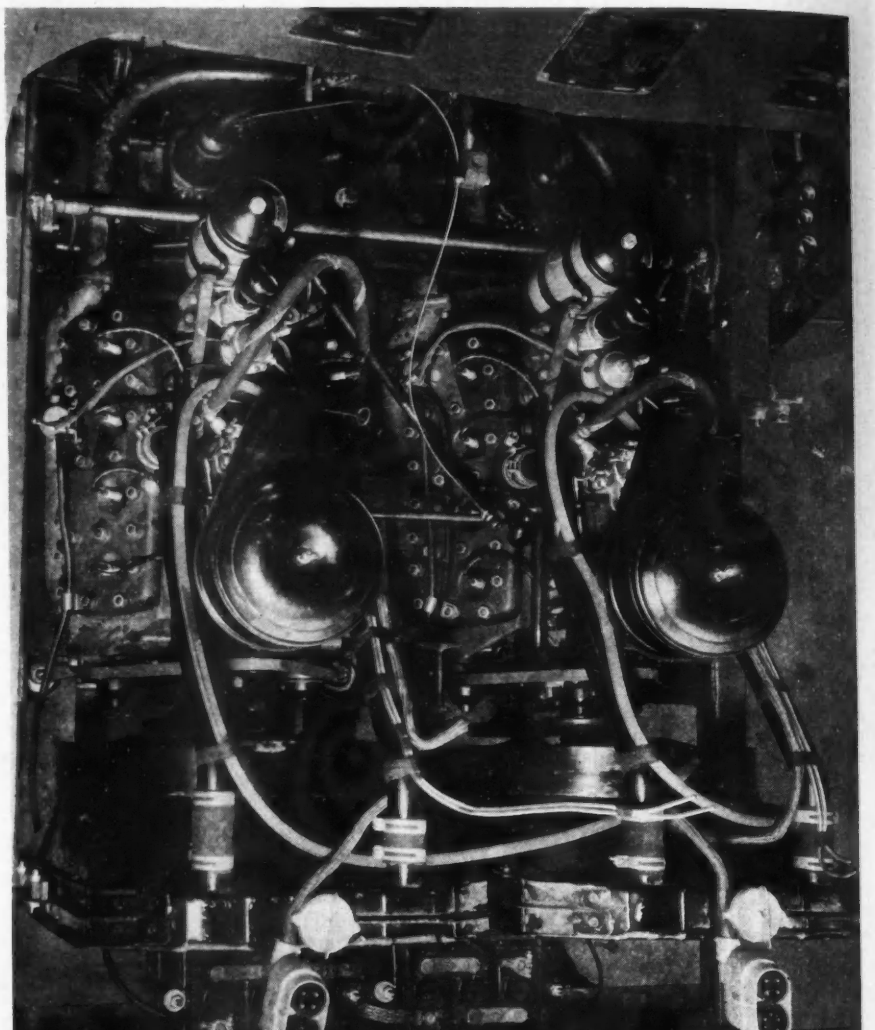
Front view of one of the special dual engine c.o.e. tractors owned by AAF

Lloyd Lawson

BIG, six-ton tractor units, each powered by two engines, are hauling over-size trailers loaded with heavy bomber airframe subassemblies 24 hours a day, seven days a week, from the Ford Willow Run Bomber Plant near Ypsilanti, Mich., to bomber assembly plants at Tulsa, Okla., Fort Worth, Tex., and San Diego, Cal. This long distance trucking operation now has been going on for more than two years, having been initiated March 7, 1942, when the first load was hauled from Willow Run to Tulsa.

The E & L Transport Co., of Dearborn, Mich., which in peacetime was engaged in the haulaway of new Ford cars and tractors, undertook this long-distance trucking operation under subcontract from the Ford Motor Co., with equipment owned by the Army Air Forces. Eighty-four tractors and 94 trailers are now engaged in this service. After nearly 11,000,000 miles of operation, only two cargo losses have been sustained. One of these occurred when a trailer side-swiped the iron girders of a narrow bridge after being forced over by an oncoming passenger car. The other happened when one of the dual tires on the trailer blew out and the adjoining tire caught fire and scorched some of the load.



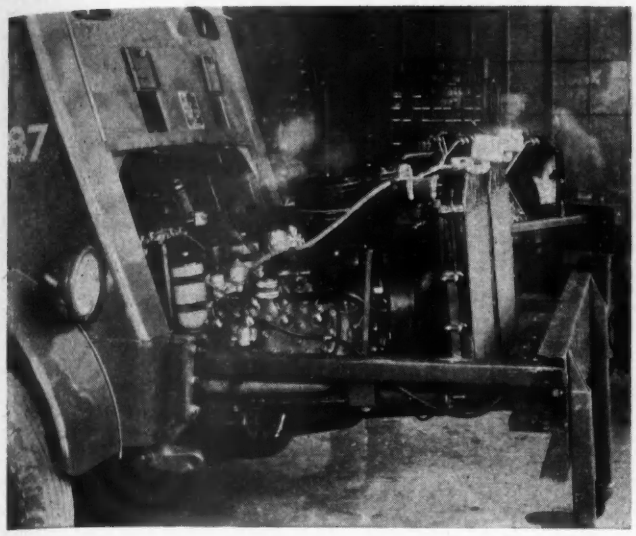
Bird's eye view of the Ford V-8 (239 cu. in.) engines. Gear Shifting, carburetion and ignition are carefully synchronized. Plugs in foreground are for wiring

A Fleet-Designed

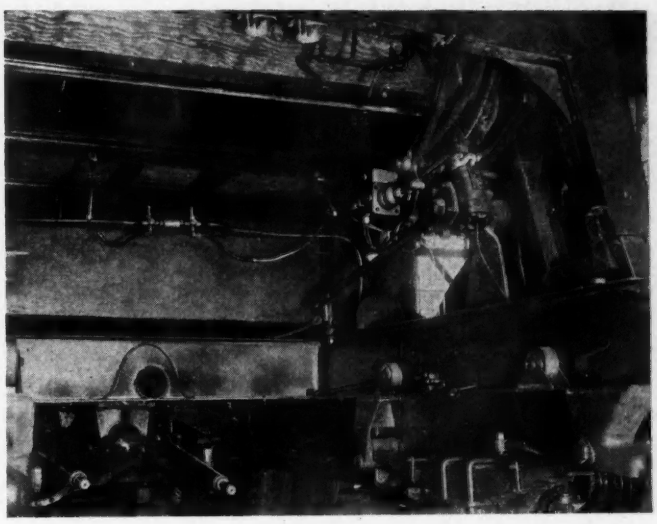
Design and maintenance details based on 11,000,000

Special equipment had to be built for this trucking operation which spans half a dozen states. A trailer was designed by the Mechanical Handling Systems, Inc., with two alternate interior arrangements, so that two trailers would carry the complete airframe, exclusive of engines, for a B-24 Liberator bomber. One trailer transports the complete fuselage, including the twin rudder tail. The other trailer carries the complete center wing section, over 50 ft. in length, and the two outer wings, as well as elevators, bombardiers' enclosure, ailerons and other airframe parts.

The trailer has an overall length



Engine pulls out for maintenance. Auxiliary legs are bolted on sub-frame. Batteries are visible in front of the radiator



Engine compartment, showing casters which carry subframe. Connections for brake, clutch and steering are at upper right

Before the war some interest was evidenced in dual-engine trucks and truck-tractors. Designers are even now giving consideration to this type of vehicle for post-war over-the-road service.

Here is an instance of the practicability of this type of vehicle. For more than two years, the E & L Transport Co., Dearborn, Mich., which in peacetime was engaged in the "haul-away" of new automobiles, has been operating dual engine, six-ton tractors with special semis with excellent results.

Starting as an experiment, today 84 of these tractors are in daily over-the-road service. Construction, operation and maintenance details are outlined here.

Dual-Engine Truck

miles of operation, 24 hours a day, seven days a week

by LLOYD LAWSON

President, E & L Transport Co., Dearborn, Mich.

of 63 ft., 6 in. It is 12 ft., 6 in. high and 8 ft., 10 in. wide, 10 inches wider than standard highway regulations. The overall length with the tractor is 73 ft., 7 in., making it the longest tractor-trailer combination in regular operation on U. S. highways. This is longer than allowed by law in any of the 48 states (Arizona is the most liberal state, allowing a maximum of 65 ft.) and more than double the Illinois limit of 35 ft. However, the Army Air Forces arranged for a waiver of all these state laws in the interests of the war emergency. The Ford Motor Co. and E & L Transport Co. both cooperated in the design of these trailers. The trailer has a tandem axle arrangement, each axle being equipped with dual wheels. A removable canvas top facilitates the loading of the parts. The trailer weighs 22,000 lb. The three general load types weigh 9000 lb. for the fuselage sections, 18,000 lb. for the wing sections and 27,000 lb. for a boxed load of airframe spare parts.

The tractor was built by Dearborn Dual Drive, Inc., an affiliate of E & L Transport Co., with the cooperation of the Army Air Forces. Basically the powerplant is built from standard Ford truck and engine parts, with certain innovations added for this specific operation. It is a special c-o-e tractor with two Ford 8-cyl., 239 cu.in. truck engines mounted side by side under the cab floor. The two engines are synchronized to run in unison. The center shaft of the gearshift lever is welded onto the center tube of the engine sub-frame. The conventional gearshift levers of each engine are attached by bolts to a crossarm, which in turn is bolted to the center shaft. There is some "give"

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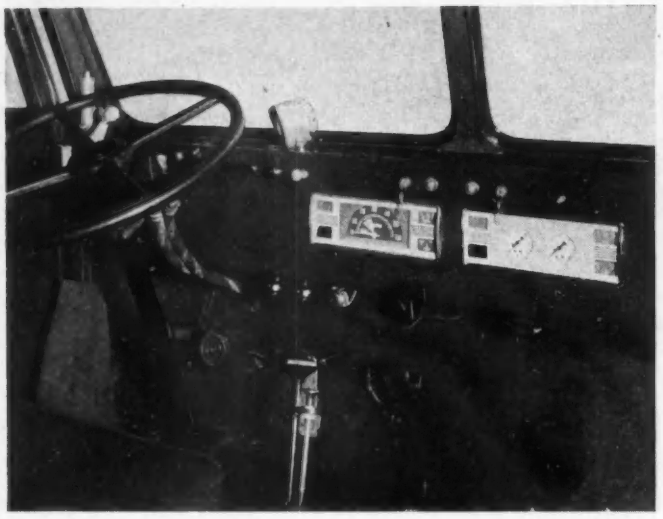
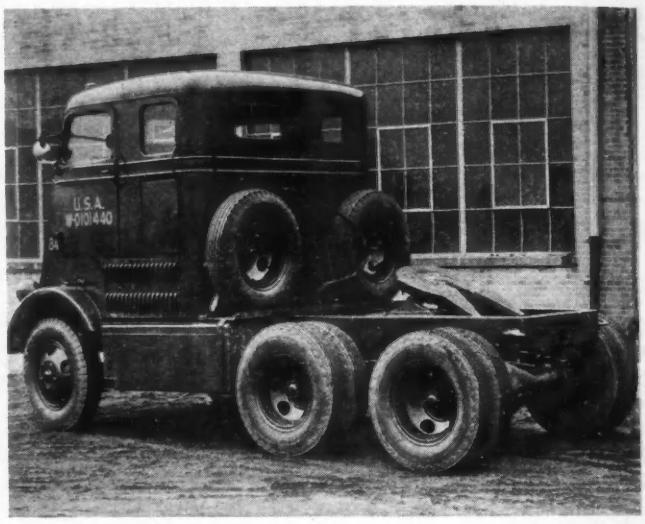


Upper left. Cab interior of dual engine tractor. One set of controls are used, but each engine has own dash instruments

Upper right. Tandem axle arrangement showing flexibility of suspension. Right rear wheels (left) are raised 20 in. Left front wheels (far side) are similarly raised, yet rear frame is parallel to the ground. Note spring trunnion between wheels



Right. Another view of tractor showing tandem axles and dual wheels. Louvers are designed to be removed for engine service

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(Continued from Page 49)

in the crossarm so that the gears do not have to mesh simultaneously. Drivers find they are able to shift just as fast as with a single transmission. In fact, when the gears of one engine start to mesh, the gears of the other seem to follow automatically.

Carburetors and ignition systems have to be carefully synchronized under the dual engine arrangement. A single accelerator controls both carburetors through a cross-bar attached to the two throttles. A manifold equalizing tube keeps the pressure in both engines constant. A single clutch pedal engages both clutch forks by means of a crossbar arrangement. There is a vacuum gage for each engine on the dashboard so the driver can tell at a glance when the gage readings are not synchronized. There also are two ammeters, two oil pressure and two temperature gages on the dash—one for each engine. Some of the tractors have a choke available for each engine, although others operate without them. The two engines are anchored together at two points by steel crossarms which still permit them to oscillate without being too rigid. The single emergency brake lever on the left side of the steering wheel actuates the propeller shaft brake.

A special streamlined exhaust system has been worked out for the dual engine setup. This dispenses with the usual Ford exhaust manifold and muffler, the outlet passages from the exhaust valves opening directly into a vacuum-type manifold. The manifolds from both engines meet at a point behind the transmissions, where they feed into a larger pipe, which is an integral part of the frame. This carries the exhaust gases the length of the frame and out a vent at the rear of the vehicle. No backpressure builds up and power is increased about 5 to 7 hp. per engine. This vacuum system operates like a syphon, the exhaust gases being sucked out through the frame.

The two engines are rubber-mounted on a special sub-frame which permits easy accessibility and removal for maintenance purposes. This subframe fits into the main frame of the tractor chassis, moving into place on four rollers, two on each side of the chassis. The center tube of the engine sub-frame, which serves as the exhaust header, telescopes into the main frame tube. The front of the engine sub-frame also serves as the front of the vehicle frame. Six bolts, three on each side, attach the front of the engine sub-frame to the main chassis frame. These joints, together with the telescope arrangement on the center tube, provide for three-point suspension of the engine unit.

When the engine unit is removed

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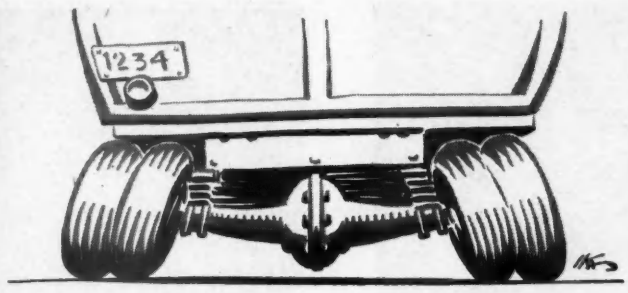


50% Overload Cuts Wheel Bearing Life 74%

Tests show that a 10 per cent overload reduces life expectancy 20 per cent and 10 per cent underload adds 41 per cent

OVERLOADING is a major cause of wheel bearing trouble. Below is a chart that shows how rapidly the average normal life expectancy of a wheel bearing falls off when actual loads exceed the bearing rating.

One point to remember is that the load ratings in a bearing catalog are not the actual capacity for each and every bearing application. Modifying factors must be used for various types of operating conditions, such as speed and the relation between thrust and radial loads imposed. It is in this way that axle beam load capacity is correctly balanced with wheel bearing capacity.

To check the effect of overloading on normal wheel bearing life, assume that a trailer axle having a rated capacity of 13,000 lb. at the tires on the ground is continuously loaded to 17,000 lb., as is commonly found. This is a 31 per cent overload. Looking at the chart we find that the life expectancy of the wheel bearings is only 42 per cent of that when the wheel bearings are loaded at their rated capacity.

This is based on the original correct bearing load distribution. If larger tires have been mounted by means of spacers, or otherwise changing the position of the tires in relation to the wheel bearings, then much shorter life may be expected with the outer wheel bearings and a very much longer life with the inner wheel bearings which would be carrying less than their rated capacity.

A projection of the chart to cover underloads would show that a 20 per cent underload would add 110 per cent to the normal life expectancy at rated load; a 30 per cent underload would add 226 per cent; a 40 per cent underload would add 448 per cent, and a 50 per cent underload would add 900 per cent.

This is only one of the troubles caused by overloading. Other troubles involve tires (and difficulties with synthetic tires will be magnified by overloads), spindles, shackles, etc.

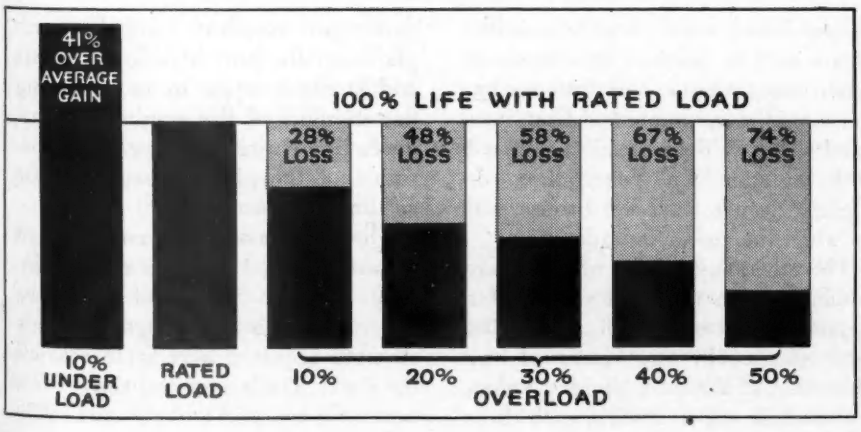
Check for Bent Axle Shaft

A quick, yet accurate, way to check for bent or sprung axle shafts is shown in the illustration below.

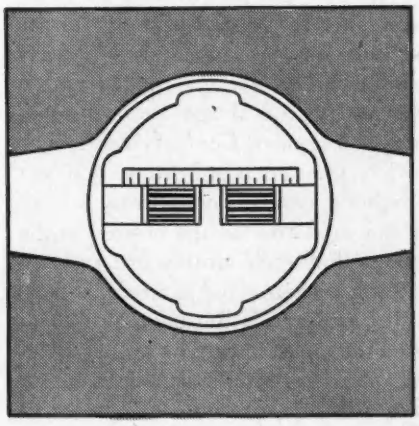
After the carrier has been removed from the axle housing, re-install the axle shafts and make sure stud nuts are drawn tight.

Lay a straight edge along the splines and turn each hub separately. If the splined end of the shaft wobbles or runs out as the hub is turned, the shaft is bent. Run-out should not exceed one-thirty-second of an inch (1/32 in.).

A wheel bearing loaded to its capacity rating will give a normal life with proper maintenance. This chart shows the effect of overloads and underloads



Sketched below is a quick yet accurate way to check for bent axle shafts



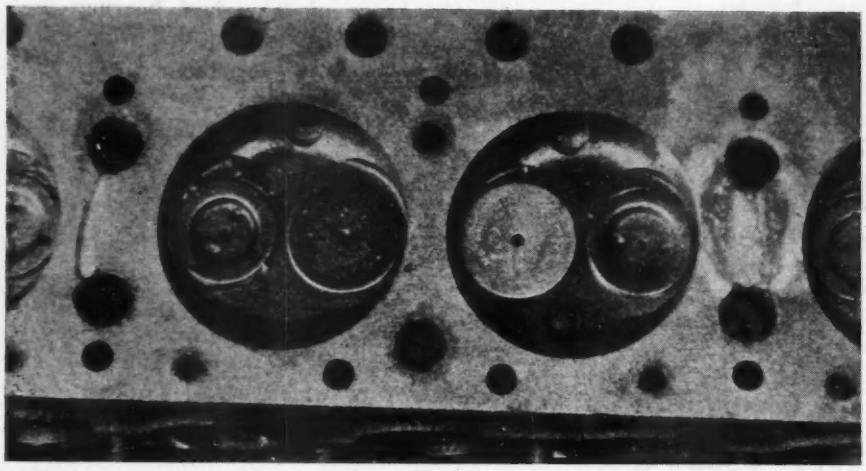


Fig. 1. An example of a non-preheated, bronze welding on cast iron. No strength is required for this repair. Requirement is sealing against leakage

Fig. 2. Experiment to show high red heat is unnecessary in bronze welding

Low Temperature *Bronze* Welding of C

Alex. F. Morton

Experience-tested, local heating method saves time lost waiting for part to cool, provides proper penetration with almost total absence of distortion; cuts machining

by ALEX. F. MORTON

THE practice of pre- and post-heating cast iron part to be welded is a hang-over from the not so distant past when a cast iron filler rod was used almost exclusively in making such repairs. While there are some few jobs that cannot be properly repaired except by using a cast iron rod and pre-heating, their number is gradually being reduced.

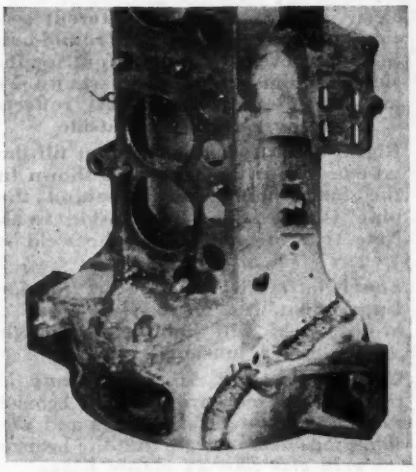
The pre- and post-heating of a cast iron part to be repaired by bronze welding has been discarded entirely by the writer, for the reason that it has not proved of any value in making such repairs. Contrary to popular belief, pre- or post-heating will not eliminate contraction strains set up in the weld area by the bronze, to the extent that such strains are relieved when a cast iron rod is used.

Regardless of the amount of heat used during the braze or bronze welding of a cast iron part, the penetration of the bronze into the surface of the cast iron is only a few thousandths of an inch in depth. This depth of penetration can be had with an extreme minimum amount of heat, confined to the weld area exclusively, and with a skin-deep penetration, or slightly deeper than the bronze will go when the repair is under way.

The advantages to be obtained are numerous: No time lost waiting for a part to cool over-night; an almost total absence in most cases of any distortion of the part, thereby reducing machine work; and, in such cases that require machine work, less complaint on the part of the machinist; and strength equal to or exceeding the strength of the original casting, depending entirely on how the preparation of the piece for such bronze welding has been made.

The fully assembled engine head shown in Fig. 1 has two cracks running between each of the two water circulating openings. The only strength required here is to seal off the water. During normal times when new cylinder head gaskets were easily

Fig. 3. Bronze lumps built up in Fig. 2 pull iron when knocked off



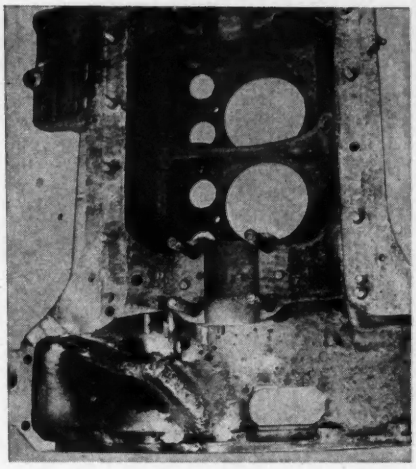
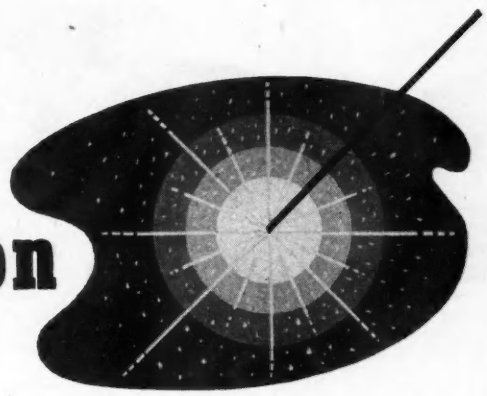


Fig. 4. The only preparation given this cast iron crankcase, in addition to steel blasting, was grinding out a 90 deg. "V" at two points and finishing with a file

Cast Iron



This is the first of a series of articles dealing with methods and techniques of low temperature bronze welding of cast iron —an efficient, economical, time-saving method of permanent repair of cast iron automotive parts.

The author is an authority on this subject, having persevered in its development despite the difficulties encountered and failures experienced in the process' early days. He has had 30 years' experience in his field, 25 of which were with one of the largest municipal fleets in the country.

His work has gained for him recognition by engineers, fellow craftsmen, fleet mechanics and the drivers who use the parts he has repaired.

This article explains the fundamentals of the process, using simple experiments as well as actual truck parts repairs to make each point clear. The illustrations are photographs made by the author in his shop.

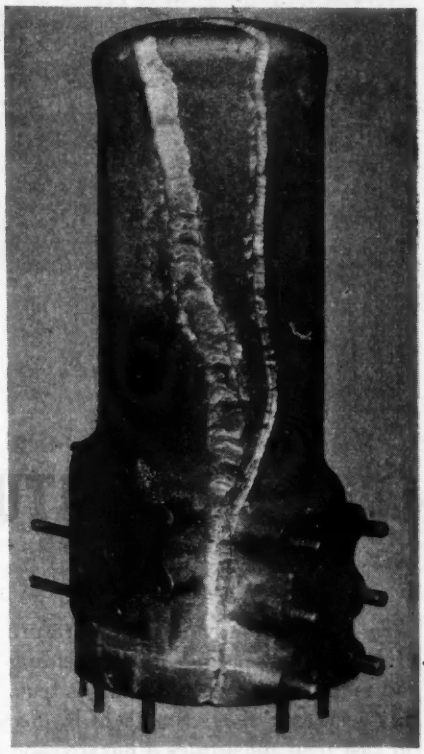


Fig. 5. Shows danger of unrestricted use of 90 deg. single bevel "V"

Fig. 6. Below. This pipe section was preheated. Note size of the opening

obtained, this job would have been passed over. But with old gaskets, a newly reconditioned head should be protected against any possible failure of the gasket remaining tight. This job serves as an example of a non-preheated, bronze-welded cast iron part.

Fig. 1 shows one crack chipped out for the bronze welding and the other crack filled slightly higher than the surface of the base metal. Finishing the surface was done with a file.

This repair serves to illustrate the meaning of low temperature—a total absence of pre-heating. It also serves to demonstrate surface heat, skin-deep heating for skin-deep penetration of the bronze filler metal. It is the result of many years of trying and after many, many failures.

Extreme Strength Hazardous

"Bronze welds, correctly made, are from two to three times as strong as Cast Iron welds, and closely approximate the strength of Mild Steel welds"

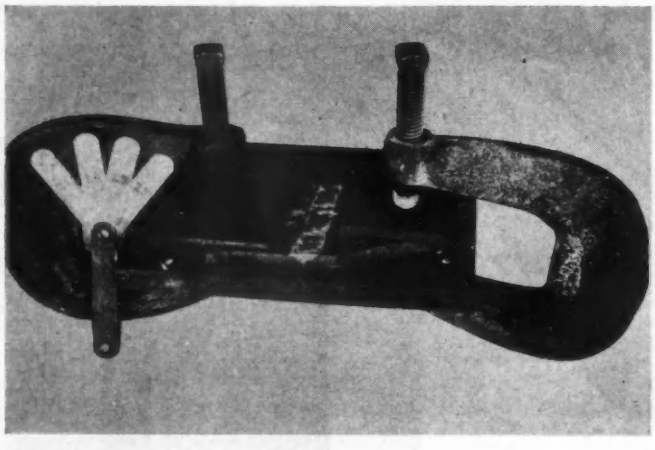
(Turn to Next Page, Please)

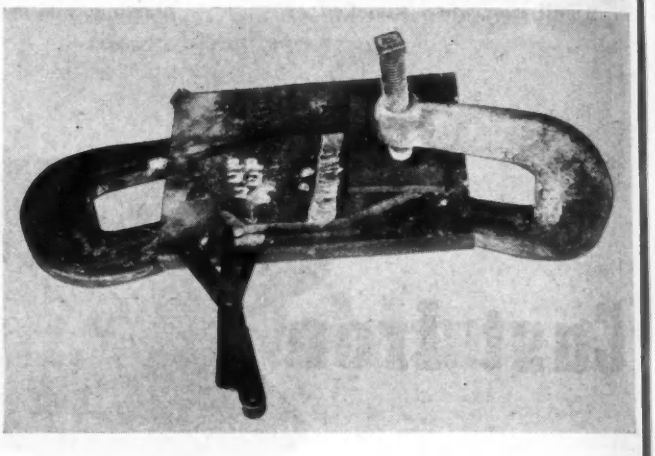
Left. Fig. 7. Using a different section of cast iron pipe, round-bottomed grooves are chipped out for inside and outside welds, as shown by arrows. Mirror behind pipe reflects groove chipped on outside

Right. Fig. 8. The welds that fill the grooves shown in Fig. 7 are shown in the foreground. Mirror behind the pipe is tilted to show inside weld. Note that the crack opposite weld is of minimum size

Lower left. Fig. 9. The set up for Experiment No. 3 to show that a bronze weld will hold even though under tensional stress

Lower right. Fig. 10. One clamp is removed to measure pull of bronze weld. Subsequent clampings and unclampings demonstrate that the bronze weld acts like an elastic hinge





LOW TEMPERATURE BRONZE WELDING OF CAST IRON

(Continued from Page 53)

—so reads the advertising literature of one of our leading bronze welding rod manufacturers. While this is true, this very excessive strength of bronze on cast iron constitutes a hazard, and the use of bronze and the amount used for a given purpose must be given consideration at all times.

Blast Surface Clean

Fairly good bronze welds on cast iron can be made on dirty, rusty, greasy, scaly or painted surfaces. Of course, grinding, chipping, filing, and wire brushing will help make a better surface. But the ideal surface for the best bronze welds is obtainable by steel grit blasting the surface to be worked on with sharp grit. Such a surface gives the best results on water jackets especially when water tightness is wanted.

The amount of red heat that a piece of cast iron will stand without cracking is unbelievable until tried. High red heats can be made in small areas, within large areas thick or thin without cracking the base metal, providing the base metal is not brought to the melting point. However, no such high red heats are necessary for surface heat bronze welding of cast iron.

High Red Heats Unnecessary

To many welders, who use a good soaking red heat down through the thickness of the casting and anywhere from an inch to an inch and a half wide, surface heat welding may not be so easily understood. Therefore, before bronze welding of cast iron parts is attempted, it will be time well spent to make a few simple experiments.

Experiment No. 1

After steel grit blasting the small power take-off housing, shown in Fig. 2, we build up three hills of bronze and one of cast iron, using a number two tip on our torch. This is a continuous operation, going from one lump to the next, heating only a small spot, directly beneath each lump. The heat color should disappear from the surface of the cast iron almost as fast as the flame is removed from the surface of the iron after our lump or hill has been built up. The heat is not applied long enough for it to either soak through or spread very far over the surface on which we are working. Enough heat, however, is used to bring the spot to a dark red, or hot enough for the bronze to spread, sink into and tin the spot on which the hill of bronze has been built.

After the entire piece has dropped to room temperature, each of the hills, or lumps, is struck away from its base on the housing. Fig. 3 will show the result. Each of the lumps pulled out a good portion of the cast

(Turn to Page 94, Please)

Overloads Overheat Synthetic Tires

Even with rayon cord, synthetics generate higher temperatures. The critical point of 9.00x20 is 230 deg. Rules for best mileage

by W. H. ELLIOTT

Manager, Field Engineering Dept., The B. F. Goodrich Co., Akron, Ohio

W. H. Elliott

The exact effect of the application of GR-S synthetic rubber to a 9.00x20 tire in the proportion of 70 per cent synthetic and 30 per cent crude rubber is shown on the accompanying chart.

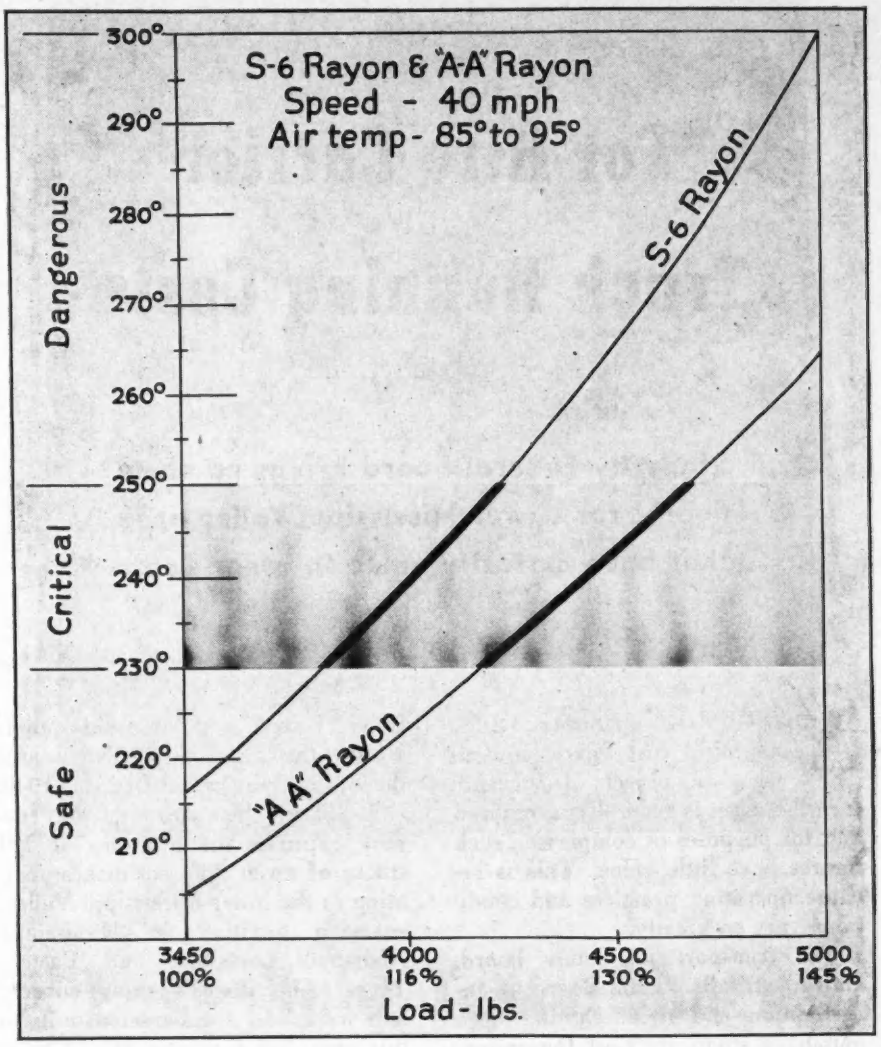
This chart shows that the synthetic truck tire, even with rayon cord, operates at a much higher temperature, as shown on the left-hand side of the chart. The rated load carrying capacity of the 9.00x20 tire is 3450 lb. and at that loading, the synthetic truck tire operates at 15 to 16 deg. higher temperatire. As the load goes up, you can see how this differential in temperature increases.

It has been established that the critical operating temperature of a 9.00x20 is reached at approximately 230 deg. This chart shows that at a speed of 40 m.p.h. this temperature is reached with a load of approximately 3600 lb. on the 70 per cent GR-S rubber rayon tire, while the AA rubber rayon tire does not reach this temperature until a load of approximately 4200 lb. is reached. Continuous operation of the 70 per cent synthetic rubber tire beyond this temperature is likely to be disastrous in that the physical properties of this material are considerably lower at elevated temperatures than are those of crude rubber.

The information so far presented shows you the results of our actual experience in handling this problem of synthetic rubbers and indicates the necessity of not overloading any truck tire, particularly synthetic truck tires, and of keeping speeds within reasonable bounds.

If these tires are properly loaded and inflated and are not abused, they can be retreaded and used again. The resulting extra mileage will cause them to give service comparable to that obtained with crude rubber tires under pre-war average care and conditions. But if these tires are overloaded, driven at excessive speeds, or abused, they will fail at low mileages. If so treated, there will not be enough materials, facilities, or manpower to make replacements and

(Turn to Page 173, Please)



This chart shows the safe, critical and dangerous heat ranges of 9.00-20 ten-ply tires made of "AA" Rayon and S-6 Synthetic with Rayon. The "AA" Rayon tire is an all-crude rubber carcass and the S-6 Rayon is 30 per cent crude and 70 per cent synthetic with the tread being entirely of synthetic rubber

For-Hire Carrier Truck Running Costs

Study by Federal board brings up some figures for Lower Mississippi Valley area that have curiosity value to other fleets

AMONG fleet operators, truck operating cost figures are always an object of curiosity even though it is generally recognized that for purposes of comparison such figures have little value. This is because operating practices and conditions vary so greatly.

The transportation study board, known officially as the Board of Investigation and Research, has been making a study of "Cost Determinations Applicable to For-Hire Motor Transportation." Based on a comprehensive field investigation, the study developed the cost of transporting commodities in motor vehicles between places and terminal points within the Mississippi Valley area during the year ended Dec. 31, 1940.

Tabulated herewith are the running expenses for a group of 181 trucks of seven different makes operating in the lower Mississippi Valley, covering territory in Mississippi, Alabama, Louisiana and Eastern Texas. The Board's study covered 306 truck and truck-tractor units in this area, but a great many of these units had an operating period of less than 12 months. With the exception of four units of one make, which had an operating period of 8½ months, all of the costs included in the tabulation shown here are for a full year's operating period.

The running expenses include only those items which vary with miles operated. Most of the column headings in the tabulation need no explanation. The following need clarification:

"Servicing" includes the wages of employes engaged in such work and of garage and shop employes not engaged in making repairs. The cost of miscellaneous servicing supplies, such as grease and alcohol, is apportioned to this category.

"Outside" consists of the expense for repairs paid to outsiders. "Parts" and "Labor" cover costs incurred in the carrier's own shop.

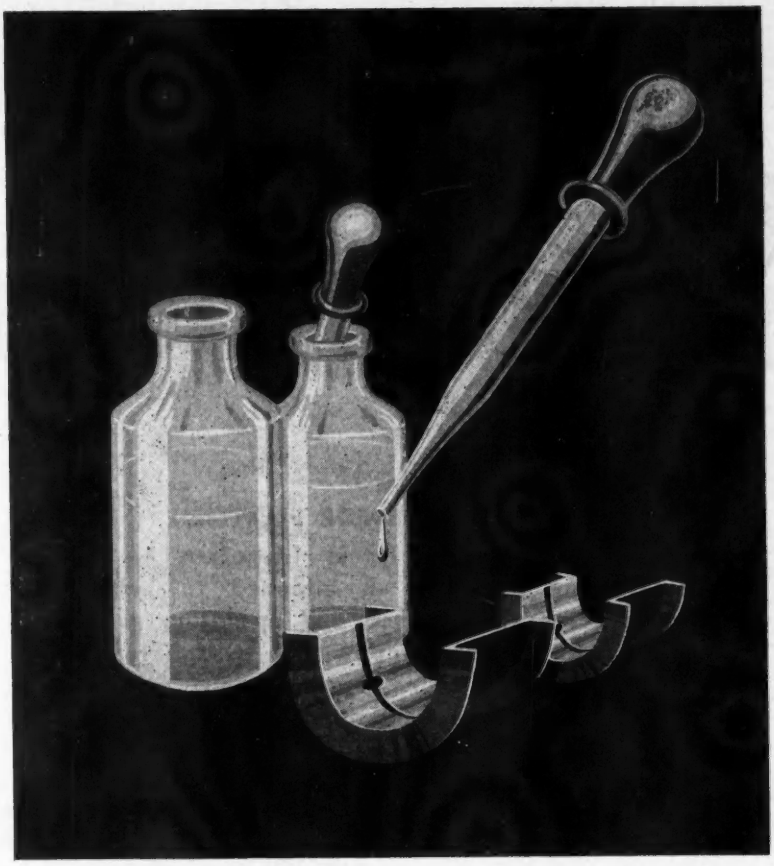
"Other Shop Expense" includes the cost of minor shop-and-garage expenses not provided for elsewhere, such as miscellaneous taxes, fire and theft insurance, rents, light, heat, water and power expenses that were incurred in the operation and maintenance of the shop and garage, and depreciation of shop and garage values allocated to the units on the basis of direct labor cost of shop repairs to revenue equipment.

Up to the column "Cost Per Mile" all of the expenses are averaged by adding up all of the expenses in each vehicle classification and dividing by the number of vehicles.

The "Cost Per Mile" figure was produced by taking the total mileage for all vehicles in a classification and dividing it into the total running cost for all vehicles in that classification.

MAKE OF TRUCK	Carrying Capacity (lb.)	Number of Units Involved	RUNNING EXPENSES (12-month average per unit involved)										Cost per Mile (Cents)*
			Gasoline including Taxes	Oil including Taxes	Servicing	Repairs: Outside	Repairs: Parts	Repairs: Labor	Other Shop Expense	Tires and Tubes including Repairs	Total Running Expense	Mileage	
STRAIGHT TRUCK UNITS													
Chevrolet	7,000	22	$296.16	$15.98	$14.61	$47.31	$87.13	$58.65	$10.65	$52.57	$583.06	16,148	3.611
Diamond T †	7,000	4	492.54	40.59	16.35	.....	390.17	201.72	30.08	90.63	1,262.08	20,026	6.302
Ford	4,000	1	176.60	13.80	8.75	68.94	.....	.....	.....	65.50	333.59	12,679	2.631
Ford	7,000	43	337.12	25.47	14.74	31.13	119.20	50.32	22.14	54.35	654.47	17,311	3.781
Ford	10,000	2	214.66	16.93	.....	.....	161.68	18.97	7.48	78.87	498.59	7,430	6.711
G. M. C.	10,000	3	601.22	45.82	.....	.....	305.68	59.13	23.30	101.70	1,136.85	23,156	4.909
International	4,000	4	221.92	18.69	13.55	78.30	.....	3.24	.47	31.64	367.81	11,444	3.213
International	7,000	16	292.34	17.84	12.02	46.62	83.99	44.79	19.10	45.86	562.56	13,390	4.201
International	20,000	1	1,030.89	64.45	.....	.....	672.78	101.75	40.10	173.73	2,083.70	39,851	5.229
Mack	10,000	2	252.06	35.02	.....	.....	226.40	22.67	8.93	56.62	601.70	8,879	6.776
TRACTOR—SEMI-TRAILER UNITS													
Chevrolet	20,000	6	1,230.76	60.41	57.78	193.88	186.56	158.87	66.11	415.28	2,369.67	69,568	3.406
Diamond T	20,000	2	2,394.70	113.28	38.64	.....	497.82	312.56	46.60	893.19	4,296.79	104,214	4.123
Ford	18,000	1	1,161.41	84.80	16.28	.....	427.31	213.38	31.82	341.60	2,276.60	61,949	3.673
Ford	20,000	9	1,261.80	57.54	35.32	85.89	389.31	185.98	133.37	459.69	2,608.90	68,026	3.835
G. M. C.	25,000	6	1,736.80	50.86	.....	.....	596.89	213.40	84.09	475.42	3,157.46	61,197	5.117
International	20,000	49	1,842.51	118.87	62.46	105.61	522.62	321.09	98.80	660.10	3,732.06	98,666	3.782
International	25,000	3	2,594.62	76.60	.....	.....	558.59	337.58	133.04	760.02	4,460.45	97,601	4.570
Mack	20,000	1	1,287.17	76.01	123.76	331.37	11.66	90.40	1.58	514.41	2,436.36	77,232	3.155
Mack	25,000	1	2,174.24	42.85	.....	.....	573.92	297.14	117.10	513.21	3,718.46	85,907	4.328
White	20,000	2	1,670.60	43.93	30.40	20.65	294.50	185.10	80.49	566.57	2,892.23	82,345	3.512
White	25,000	1	2,068.33	91.78	.....	.....	573.40	255.62	100.73	662.74	3,752.60	73,902	5.077

*—Total Running Expense divided by Total Mileage for all of the units involved. †—8½-month operating period.



Easy Acid Tests Check Engine Bearing Materials

Simple tests that do no harm to bearings can help fleetmen identify materials at a time when substitutes cause some confusion

by JOSEPH GESCHELIN
Commercial Car Journal Detroit Technical Editor

AMONG the many problems facing fleet operators during the war, not the least is that of making sure of the proper identification of main and rod bearings for their engines. Surely nothing is more deadly to the life of an engine than the misapplication of bearing alloys.

How can the fleetman identify "white" metal bearings? Suppose you have a stock of bearings on hand, from various sources, how sure are you that what you install in the engine is a cadmium-base or lead-base babbitt or tin-base babbitt? That was no problem heretofore; it is an important one today.

Although the chemist with his laboratory facilities has sure means for testing any bearing alloy, such procedures are beyond the scope of the fleetman's shop facilities. Accordingly, we sought the advice of the experts as to simple methods which could be readily used in the field. Recommendations given here are based upon specific reports from General Motors Research Laboratories, Federal-Mogul Corp., and The Cleveland Graphite Bronze Co.

In all of the following tests the procedure is non-destructive. No harm is done to the bearings. It is recommended that after each test is completed, the bearing be washed off with plain, cold water. Naturally there will be a discoloration due to the etching of the chemicals but this is meaningless and can be ignored.

Federal-Mogul's suggestions stem directly from the "Handbook of Sleeve Bearings" which was published by the company several years ago. The procedure described below gives a simple identification of "cadmium-alloy" and "lead-base alloy." If the test is negative, it may be assumed that the bearing is of "tin-base" type.

Cadmium Alloy Test

It is frequently necessary to determine quickly the basic identity of a "white metal" bearing. This test will determine if the metal is cadmium alloy, such as cadmium-silver-copper, or cadmium-nickel, but will not distinguish differences between cadmium alloys.

Two chemicals are required:

No. 1 Ammonium Nitrate, 50% Solution

No. 2 Sodium Sulphide, 50% Solution

(A 50% solution is one-half water)

Two medicine droppers are required; always use the same dropper for the same chemical.

Clean the surface to be tested, of all grease, oil and oxides, to reach clean metal and deposit a drop of the No. 1 chemical.

(Turn to Page 265, Please)

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L177. Brake Manual

A most unusual brake manual has come to our attention. It differs from most books on this subject in that it does not tell how to reline or adjust brakes.

This book deals entirely with engineering principles and general fundamentals of brake operation. It will make an excellent text book for all fleetmen who are looking for mechanic training material, and who would like to review and refresh their knowledge of all principal types of brakes used on trucks and passenger cars.

There are 72 pages, 8½x11 in. in size.

The book was published to sell at $1, but COMMERCIAL CAR JOURNAL readers may have a copy free simply by writing L177 on the free postcard between these pages.

L178. Cleaning Handbook

This new handbook outlines various methods for handling fleet maintenance cleaning problems with minimum effort and in the minimum time. The text covers everything from washing truck bodies and cooling systems to parts degreasing and cleaning shop floors.

While centered around specific detergents and cleaning compounds, the recommendations given are based on results achieved by the combined efforts of engineers, chemists and maintenance men with the object of handling fleet maintenance cleaning jobs with speed, efficiency and economy. A number of the latest methods are illustrated. Copies are available by writing L178 on the free postcard.

L179. Truck Tire Manual

Here is one book that deals entirely with abuses that lead to premature truck tire failures.

Entitled, "Truck Tire Abuses and How To Prevent Them," this 16-page, 8½x11-in. booklet contains excellent material for educating drivers to the necessity of conserving tires by avoiding practices and habits that lead to the destruction of the all-important carcass. Blow-outs, ply separation, bruises, cuts, etc., are fully explained and illustrated.

It is suggested that fleet operators get at the source of most of their tire troubles by placing a copy of this manual in the hands of every driver. A sample copy will be mailed to any fleetman simply by writing L179 on the free postcard.

L180. Fleet Lubrication Booklet

One of the major oil companies has just published a very interesting 28-page, 8½x11-in. booklet dealing with general uses of lubricants. The section on automotive lubrication contains much data that will be of real interest to fleetmen.

On pages 14 and 15, for example, there is a large chart showing the operating temperature of various types of greases. While a number of these greases might not be used on a standard truck, there are those that apply to some fleet requirements, such as for off-the-road operations.

On page 20, for another example, a convenient lubrication chart is shown for certain trucks. Recommendations for all points requiring lubrication are given in detail. A footnote at the bottom of the page points out that similar charts are available for every make truck.

A copy of this booklet will be mailed to any fleetman who writes L180 on the free postcard.

L181. Welding Handbook

One of the leading manufacturers of welding equipment and accessories has published a very interesting and instructive welding handbook, entitled, "Causes and Cures of 14 Common Welding Problems." Because of its practical nature, every fleet operator should procure a copy.

This handbook should prove valuable not only for mechanics who have not completely mastered the correct welding technique, but should be a great aid for problems that, at times, puzzle experts. The text is handled in cause-and-remedy style, and numerous illustrations are used to show correction of the various problems.

A copy will be mailed without charge or obligation simply by writing L181 on the accompanying free postcard.

L182. Manpower Training

Some fleets have been obliged to employ minors to fill vacancies caused by military or other losses of

(TURN TO PAGE 92, PLEASE)

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NEW PRODUCTS

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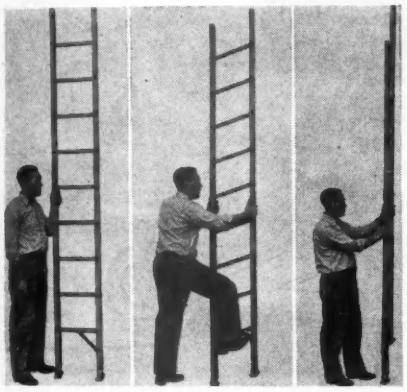
P223. Folding Ladder

Here's something new in step ladders—a step ladder that folds to a 3x3-in. bundle, permitting storage in the minimum space for its length.

This ladder should find many uses among fleet operators. It is known as the Duo-Safety Folder Ladder Series G, and manufactured by the Duo-Safety Ladder Corp., Oshkosh, Wis.



It comes in 6 to 20 ft. lengths, has a special safety lock to prevent accidental folding, and, if desired, comes equipped with safety shoes. It is said to be lighter in weight than standard ladders of equal size.

The illustration shows, from left, the open ladder, releasing of the locking device, and ladder in folded position.

Use Free Postcard For More Details.

P224. Crack Repair

A useful repair kit for badly cracked engine blocks, housings and various mechanical repairs is being offered by the Miller Mfg. Company of Camden, N. J.

This kit contains 2 lb. of metal rods in assorted sizes, two pints of Wonder Seal, and an O.D.T. Instruction Manual. It contains sufficient rods to do from two to 10 jobs.

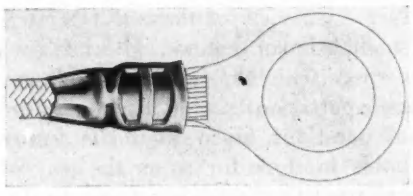
Rods alone are available in 2-lb. packages. Sizes offered are, 1/8 in., 3/16 in., 1/4 in. and 3/8 in. rods.

Use Free Postcard For More Details.

P225. Solderless Terminals

The Aircraft-Marine Products, Inc., Harrisburg, Pa., has developed new solderless instrument terminals which are said to be virtually impervious to corrosion over long periods of time. Rigorous tests caused no increase in the resistance of these solderless terminals.

The manufacturer states that many factors have been utilized and combined to develop the new instrument

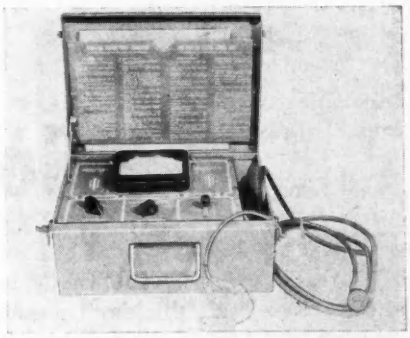


terminal. Among these were the correct base metals, appropriate methods of heat treatment, accurate structural design and proper plating. Also of importance was the designing of the complementary installation tool. It is an ingenious but simple crimping tool, resembling a pair of pliers, which crimps the strands of wire and the connector into a homogeneous mass that insures perfect electrical connections.

Use Free Postcard For More Details.

P226. Condenser Tester

Lanagan & Hoke, Inc., Philadelphia, announces the introduction of a new condenser tester designed for making a thorough check-up, including tests for breakdown, leakage, capacity, and series resistance.



Known as the Lanagan Model 112B Condenser Tester, it is equipped with a four in. D'Arsonval movement meter, marked in colors, with one switch for all tests. It is made so that line voltage can be adjusted to suit conditions. A pilot light acts as an off-on indicator.

This tester is said to be simple to operate, and is guaranteed against defective workmanship and material for one year.

Use Free Postcard For More Details.

(TURN TO PAGE 88, PLEASE)

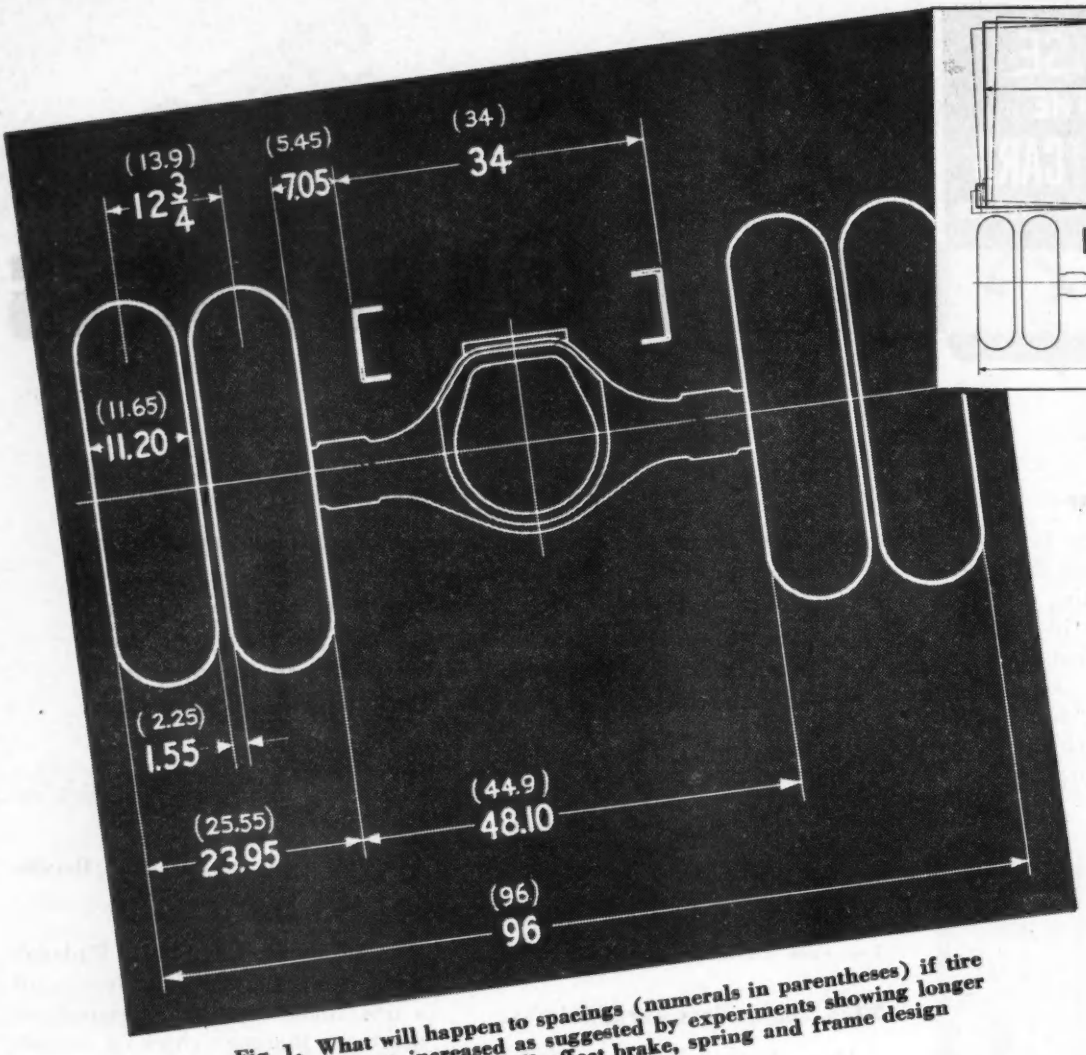
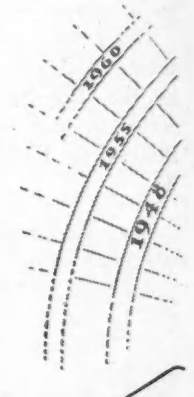
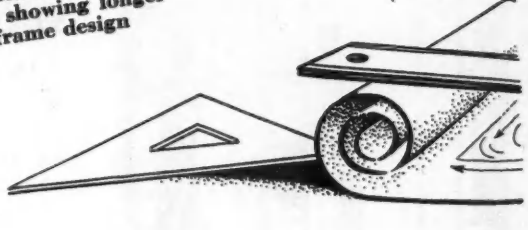


Fig. 1. What will happen to spacings (numerals in parentheses) if tire base widths are increased as suggested by experiments showing longer tire life, and how it will affect brake, spring and frame design

Fig. 2. A 96-in. body in motion occupies space of 102 in. Recognition would improve design





Coming Changes in Truck

B. B. Bachman

EVERYONE, in thinking ahead, cannot help but speculate on the form which the new things will have. We know that through destruction and the interruption of normal processes forced on us by the war, opportunity will exist for starting almost with a clean slate. This destruction, as ghastly as it is, has, nevertheless, created the opportunity for correcting the errors of earlier days and eliminating the handicaps of archaic structures. In view of these things, it is small wonder that we, who are concerned with the field of highway transportation, should feel the surge of questions as to what the future holds in store for us in the way of opportunities for doing things in different and better ways.

The first thing to be considered in trying to determine what the future developments may be is the kind of roads on which our new vehicles will operate. Probably the most definite information as to the character of thinking being done relative to the future highways, is contained in the Report of the National Interregional Highway Committee. The report proposes that provision shall be made in the design, or allowance made for subsequent provision for handling estimated traffic to be expected 20 years from the date of construction.

The following dimensional factors are proposed for the vehicles:

Width	96 in.
Height	12½ ft.
Length (overall including bumpers and load)	
Single Vehicle	35 ft.
Tractor and semi-trailer combinations	50 ft.
Other combinations	60 ft.
Axle load[1] on pneumatic tires	18,000 lbs.

[1]Defined as the total load on all wheels

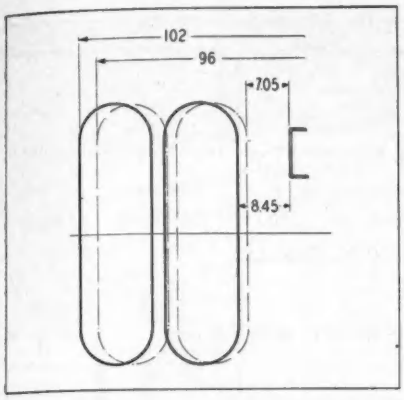
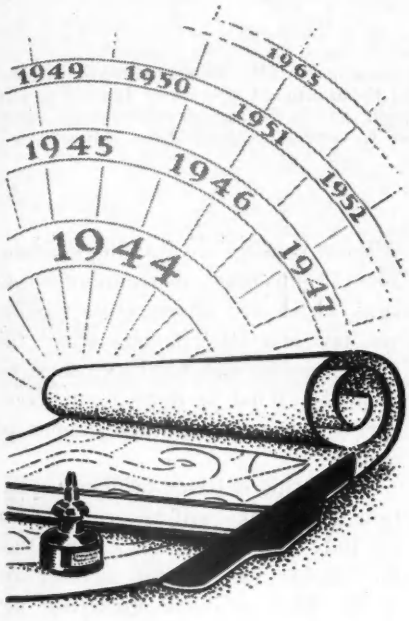


Fig. 3. Permissible width of 102 in. in chassis would provide enough additional space for wider springs and tire rims and better braking

An engineer guesses at the probable effect of post-war highway standards, of higher octane gas, of lighter weight materials, of greater horsepower and speed

by B. B. BACHMAN

Vice President in Charge of Engineering, The Autocar Co.



ROADS — "Changes in road structure would create greatly different operating conditions and form the basis for considerable change in the vehicle." REAR ENGINES—"Because of loading requirements rear engine mounting does not appear attractive except on a limited number of specialized vehicles." COMFORT — "Cramped quarters are not good business. Cabs must be increased to provide room in all directions." ACCESSIBILITY—"Most designers sympathize with the desire for accessibility but unfortunately it frequently happens that the man who runs the equipment is not the man who buys it, and the latter shares the common trait of being impressed by superficial appearance." NOISE — "Noise calls for intensive study. Present vehicles make entirely too much racket.

Design

whose centers may be included between two parallel transverse vertical planes 40 in. apart.

The formula for determining the gross weight on any vehicle or combination of vehicles is W = C (L plus 40), in which,

W = gross weight of vehicle in pounds,

L = length in feet between the forward and rear axles of the vehicle or combination of vehicles, or any group of axles thereof,

C = A coefficient with the following values,

For values of L less than 18 feet, 650.

For values of L equal to or greater than 18 ft., 750.

All rural sections of the system are to be designed for a speed of 75 m.p.h. for passenger vehicles, and 60 m.p.h. for trucks and tractor combinations in flat topography. In more difficult terrain, the design shall contemplate lower speeds, but in no case less than 55 m.p.h. for passenger vehicles, and 35 m.p.h. for trucks in mountainous country.

The width of lanes provided is 12 ft., and generous dimensions are stipulated for shoulders and median strips. Minimum sight distances, limits of curvature and banking of curves are provided which contribute to the capacity for safe operation.

Gradients range from 3 per cent to 6 per cent dependent on topography and the traffic density anticipated. Separation of grades at intersections and regulating access to the road promotes speed and safety.

Vehicle Width

With the foregoing road characteristics available for consideration, it is of interest to study vehicle width.

While the width of traffic lane is 12 ft., the width of the vehicle is limited to 8 ft. In view of the fact that a program involving billions of dollars and many years is under consideration, this relation should receive careful study.

The 96-in. width limit on vehicles has been in existence for a long time. By 1940 all states had adopted this dimension while Connecticut and Rhode Island had adopted 102 in. Such a preponderance of opinion would seem to establish the validity of the 96-in. width on very solid ground. However, an analysis of the subject develops some very important questions.

In the early days of the truck, the

(Turn to Next Page, Please)

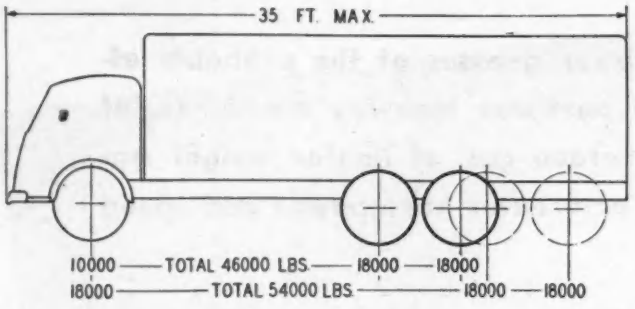


Fig. 4. How a 35-ft. six-wheeler could be increased from 46,000 gross to 54,000 by setting back the rear axles

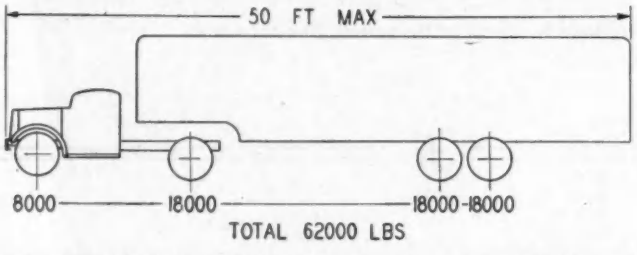
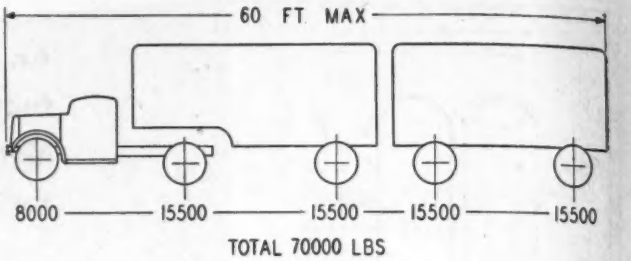


Fig. 5. With limits of 50 ft. in length and 18,000 lb. axle weight tractor-semi would need 4 axles for 62,000 gross



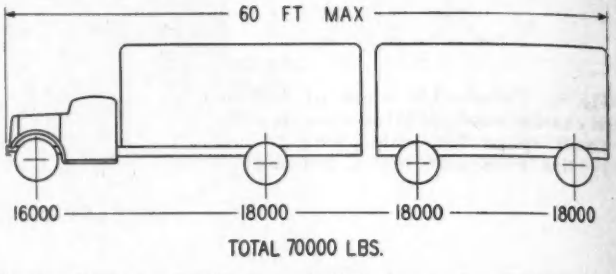


Fig. 6. In top combination 70,000 lb. gross could be provided in 60 ft. overall by means of five axles loaded to less than the 18,000 lb. limit. In the bottom combination 70,000 lb. gross could be obtained with four axles

COMING CHANGES IN TRUCK DESIGN

(Continued from Page 61)

solid tire was used universally and maximum cross sections did not run much over 14 in., which left ample space between the wheels for brakes, springs and frame. With the advent of dual pneumatic tires, the picture has changed materially.

The smallest tire which can be used to match the 18,000 lb. axle loading permitted is the 10.00-24, with a rating of 4550. The use of the 24-in. base diameter tire is undesirable in highway work, due to the extra height of center of gravity which it produces.

A reduction in diameter of base makes an increase in cross section to 11.00 necessary to reach the desired rating. The 11.00 tire mounted on the 7.33V (9-10) rim with 12¾ spacing requires a space of 23.95 in. with 1.55 in. between tires, leaving a space between the inner tires of 48.10 in. (See Fig. 1, heavy numerals.) Recent proposals by the tire manufacturers based on experiments made by them indicates that desirable improvement in life of the tire can be obtained by increasing the width of the tire base.

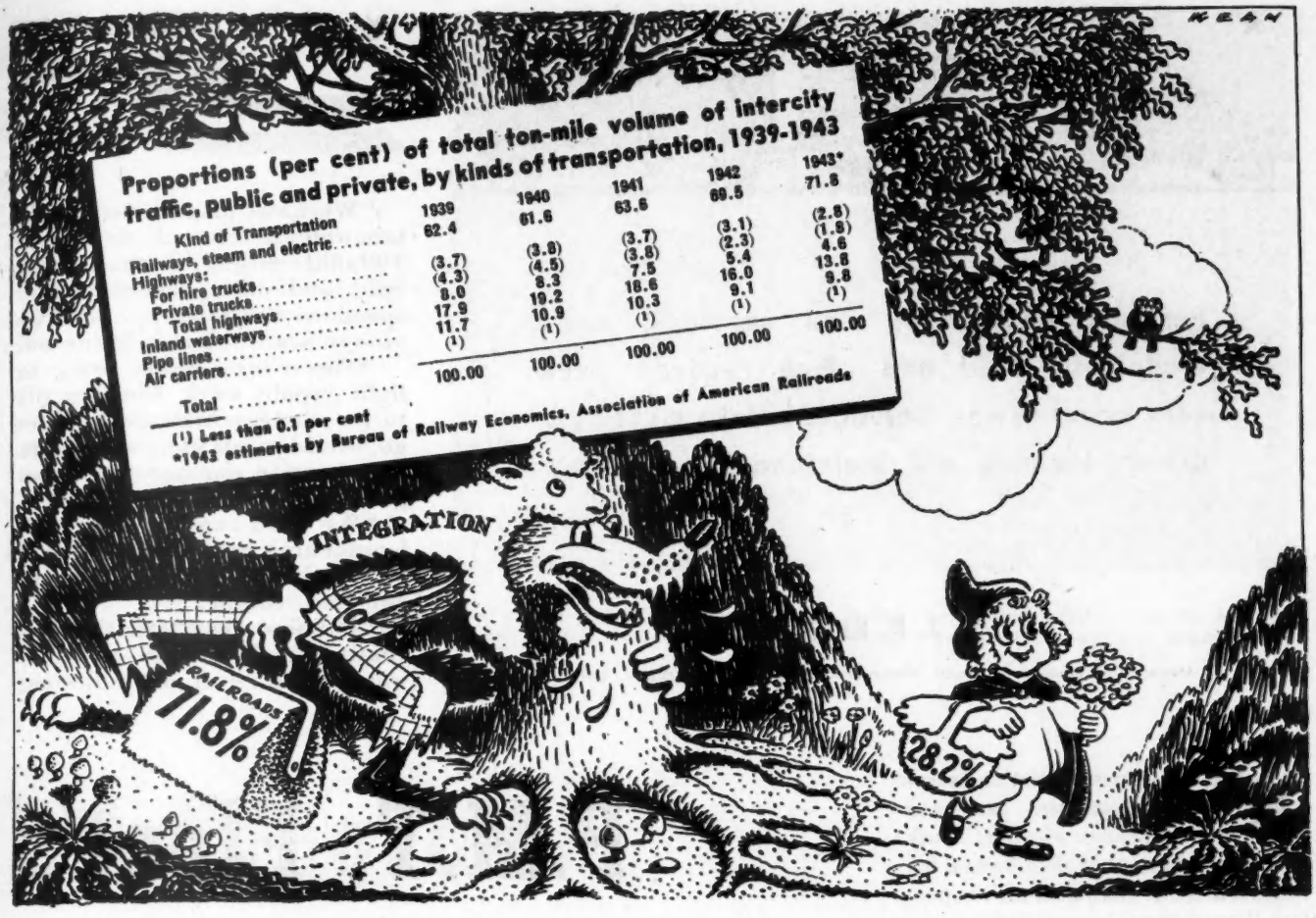
At present, the width of the base on the 11.00 size is 7.33 in. By increasing this to 8.37 in., there is accomplished a desirable distribution of flexing in the sidewalls, a reduction of side rolling of the tire and an increase in air volume. Unfortunately, this requires an increase in tire spacing and causes an increase in the tire cross section. On the 11.00 tire, the spacing is made 13.9 in. and the cross section is increased to 11.65 in. (See Fig. 1, light numerals in parentheses.) The space occupied by the two tires is 25.55 in., which leaves 44.9 in. between the inner tires, or less than half the allowable overall width. Into this space must be compressed the brakes, springs and frame.

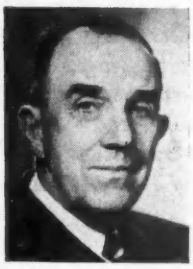
The brakes, of course, have long ago been pushed back under the tires, a location which leaves much to be desired for both the tires and the brakes. The frame is generally 34 in. wide, a figure arrived at by the requirements for the power plant installation and a straight frame rail. While an offset in the frame rail in the horizontal plane can be made without causing any production troubles, it introduces elements of weakness which are undesirable. Finally, we have left 10.9 in. into which the springs, clips and clearance must be located. What is done to a decent spring design "shouldn't happen to a dog."

All of this is based on the assumption that chains will be provided for on only the outside tire, and that the chains can extend beyond the width limit without incurring the wrath of the gendarmes.

The width limit is in one important particular placed to prevent excessive and unreasonable width for vehicles that produce a hazard to passing vehicles and interfere with the vision of following vehicles. However, no distinction is made as to the wheels and the body. It is the width of the body which limits vision, and the width of the body plus side sway which determines the clearance requirements. It seems obvious that the space occupied by a body 96 in. wide, in motion will exceed 96 in. by an appreciable amount. Now, if this fact is recognized, then it would seem practical to increase the width over the tires to a greater dimension than the body without incurring any bad effects, and, at the same time, making it possible to improve some conditions which at present are not so good.

(Turn to Page 152, Please)





John S. Worley

Integration Not In The Public Interest

Proposal to stop duplication with 12 to 18 transportation companies would deprive 50% of population of competitive services

by JOHN S. WORLEY

Professor, Transportation Engineering, University of Michigan

DURING the last 12 to 18 months the public's attention has been called frequently to alleged transportation problems. This has been done through an extensive program of public speeches, radio talks, and the mailing of literature and special letters to the individual members of the United States Congress, members of our legislatures, Chambers of Commerce, Traffic Clubs, Regional Advisory Boards, other public organizations, industrial concerns, individuals, and to schools and libraries requesting that this information be brought to the attention of students.

A proposal has been made that corrective measures be taken through the organization of 12 to 18 transportation companies, which would provide transportation service to meet all the needs of the nation, each of whom would furnish every type of service. It is claimed that unless such a program is adopted it will be only a question of time until all transportation properties will be owned and operated by the government and we will lose our free enterprise system. To have this happen would be no less than a catastrophe.

Integration, according to its pro-

(Turn to Page 168, Please)

Periodic inspections and services, controlled by field and office records, prevent breakdowns. Salvage, safety meetings, driver training aid maintenance economy

by J. H. RITTER

Manager of Equipment, Pacific Motor Trucking Co., San Francisco, Cal.

P.M.T. Fleet's

"We have inspections at certain mileage intervals clear up to 100,000 miles, controlled by field and office records of inspections and repairs, so that we always know what is going on.

"These inspections bring to light repair work which needs to be done, which work, if let go, would result in a road failure or extensive damage to the engine or other parts.

"We have experimented with lengthening the mileage interval on certain of the items and have run into trouble.

"The first year after this preventive maintenance program was fully in effect, our miles per

WE TRY to systematize everything about the care and maintenance of our truck fleet, down to the last detail. And we believe there is nothing more important than a properly executed preventive maintenance program. In fact, we are "thoroughly" sold on it, because we know preventive maintenance pays dividends. We have inspections at certain mileage intervals clear up to 100,000 miles, controlled by field and office records of inspections and repairs, so that we always know what is going on in the fleet.

This company is a Southern Pacific subsidiary and, primarily, it handles the railroad's trucking. We cover nearly all Southern Pacific rail territory in Oregon, California, Nevada, Arizona, New Mexico and east to El Paso, Tex. We own 867 vehicles, consisting of 326 trucks, 155 truck-tractors, 253 semi-trailers, 73 dollies, 32 full trailers, 23 service cars (including seven passenger cars) and five buses. Last year we covered 6,256,000 truck and tractor miles and 4,960,000 trailer and semi-trailer miles, nearly all of which

The forms on these pages, each measuring 7x7½ in.,

1

PACIFIC MOTOR TRUCKING COMPANY
AUTOMOTIVE EQUIPMENT INSPECTION SHEET

Date_____19 Speedometer Reading_____ Equipment No._____

Please check the following; using symbols: V—(if O.K.), X—(if adjustment made), O—(repairs needed). List items marked "O" on reverse side with description.

1,000 Mile Inspection

___1. Battery—Test voltage and replace if any cell reads less than 1.5 volts.
___2. Battery—Tighten hold down bolts.
___3. Battery—Clean terminals and apply corrosion preventative.
___4. Brakes—See that hand brake holds and examine ratchet and pawl.
___5. Brakes—Test service brakes when road test is made (Line No. 21).
___6. Cab and Body—Inspect top, sides and tarpaulins for leaks.
___7. Clutch—Adjust clearance below floor board to ½ inch.
___8. Cooling System—Examine radiator, hose connections and water pump for leaks.
___9. Doors—Examine door glasses, locks and hinges.
___10. Fan Belt—Adjust—V belt must have ½ inch slack.
___11. Floor—Examine for cracked boards.
___12. Fuel System—Examine carburetor, gas tank and fuel line for leaks.
___13. Horn—Test horn.
___14. Instrument Panel—See that all instruments are in working order.
___15. Lights—Examine lights and plug connections.
___16. Oil Pan—Examine and tighten oil pan.
___17. Pintle Hook—Inspect pintle hook and safety chains.
___18. Steering Gear—Check drag link, steering arm, tie rod and spindle bolts for looseness. Align front wheels.
___19. Universals—Examine and check for looseness.
___20. Vacuum Lines—Examine manifolds and vacuum brake lines for leaks.
___21. Road test vehicle noting general condition.

2,000 Mile Inspection

___22. Air Cleaner—Wash in kerosene—fill oil bath type with SAE 30 engine oil.
___23. Boosters—Fill B-K Brakemor or Detroit Boosters with ½ pint SAE 20 or 30 engine oil.
___24. Distributor—Examine points and cap. Check distributor timing.
___25. Fuel System—Clean carburetor screens and fuel pump sediment bowl. Blow out gas line.
___26. Hydraulic Brakes—Fill reservoir.
___27. Oil Filter—Drain and Clean.
___28. Overhead Valves—See that rocker arms are getting oil. Adjust valve stem clearance to .012.
___29. Spark Plugs—Remove, clean and space gap as recommended.
___30. White Clutches—Drain, flush with kerosene and refill with one-half pint of mixture of ½ kerosene and ½ SAE 30 engine oil.

2

PACIFIC MOTOR TRUCKING COMPANY
AUTOMOTIVE EQUIPMENT INSPECTION SHEET

Date_____194____ Speedometer Reading_____ Equipment No._____

Please check the following; using symbols: V—(if O.K.), X—(if adjustment made), O—(repairs needed). List items marked "O" on reverse side with description.

5,000 Mile Inspection

___31. Brakes—Adjust hand and service.
___32. Chassis and Cab—Tighten all bolts.
___33. Fifth Wheel—Inspect hold down bolts and coupler jaws.
___34. Headlights—Inspect lens and adjust beam.
___35. Radiator—Drain and flush with clean water five minutes with motor running.
___36. Tires—Match up dual tires.
___37. Valves—Adjust clearance on L. F. & T. head motors as recommended.
___38. Wheels—Tighten front and rear wheel lug nuts.

10,000 Mile Inspection

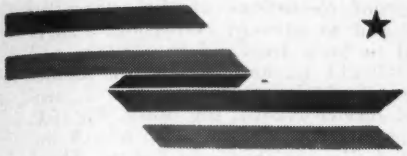
___39. Brakes—Examine drums and lining.
___40. Fuel Pump—Replace diaphragm on mechanical fuel pumps on line haul equipment.
___41. Ignition Wiring—Examine all cable and contacts.
___42. Oil Filter—Clean or replace.
___43. Spring Seats, Radius Rod Brackets—Examine for cracks.
___44. Wheel Bearings—Inspect, clean and repack with wheel bearing grease.

15,000 Mile Service

___45. Valves—Grind valves on L. F. & T. head motors on line haul work.

20,000 Mile Service

___46. Valves—Grind valves on overhead valve motors on line haul work



gallon of fuel on gasoline-powered trucks increased 3½ per cent, and our miles per quart of oil increased 22 per cent. These improved consumptions have either still further improved each year since or held practically constant, even though the average age and average size of units in the fleet have increased from year to year.

"The improvement of 3½ per cent represents a saving of 36,000 gal. of fuel per year, based on 1943 average.

"The 22 per cent increase in miles per quart of oil indicates a better all round engine condition."

One of five repair shops operated by P.M.T. for the maintenance of the bulk of its 867-vehicle fleet. Photograph shows engine rebuilding in the Los Angeles shop

PM Program

were operated in coordinated rail-truck service for Southern Pacific merchandise traffic, which helps to relieve the rail lines for handling of carload traffic. We are an over-the-road common carrier, and also conduct extensive pickup and delivery operations.

We maintain our own repair shops in five places: Los Angeles, Fresno and Lone Pine, Cal.; Tucson, Ariz.; and, Eugene, Ore., the largest being at Los Angeles. Because our trucking is usually for short distances from rail car set-out points, our fleet is based at a large number of cities and towns and a lot of units do not touch one of our own shops. As a result, a large part of our inspection, repair and maintenance work is done in commercial shops located at the base points, with which we have an arrangement for work on an hourly and material-cost basis. These shops work on instructions from us, based on the check-ups prescribed in our preventive maintenance program.

In our Los Angeles shop we have 35 mechanics, 15 helpers, five ap-

(Turn to Next Page, Please)

show the various steps employed in P.M.T.'s basic PM

3

PACIFIC MOTOR TRUCKING COMPANY
AUTOMOTIVE EQUIPMENT INSPECTION SHEET

Date.....193..... Speedometer Reading.....Equipment No.....

Please check the following; using symbols: V—(if O.K.), X—(if adjustment made), O—(repairs needed). List items marked "O" on reverse side with description.

25,000 Mile Service

—47. Bearings—Examine and adjust main and rod bearings.
—48. Cylinders—Take micrometer readings and list

Cylinder.	1.		2.		3.		4.		5.		6.	
	L	T	L	T	L	T	L	T	L	T	L	T
Top												
Bottom												

—49. Oil Pan and Crankcase—Clean oil pan and crankcase with kerosene.
—50. Oil Pump—Examine and replace gears and housings if worn.
—51. Rear End and Transmission (including Auxiliary)—Drain, flush with flushing oil, inspect through inspection plates and refill.
—52. Rings—Inspect and replace if worn more than specified limits of tension and clearance.
—53. Timing Gears—Check for noise.

50,000 Mile Service

—54. Remove and Overhaul Clutch.
—55. Remove and Overhaul Differential—Bevel gear type only.
—56. Remove and Overhaul Distributor.
—57. Remove and Clean Radiator.
—58. Remove and Overhaul Generator.
—59. Remove and Overhaul Starter.
—60. Examine Spring Shackle Bolts and Bushings.

100,000 Mile Service

—61. Remove and Overhaul Differential—Double reduction and worms.
—62. Remove and Overhaul Transmissions.
—63. Remove and Overhaul Steering Gear.

4

PACIFIC MOTOR TRUCKING COMPANY
INSPECTION OF TRAILER AND DOLLY

Speedometer Reading..... Tractor No.....
Date.....194..... Equipment No.....

Please check the following; using symbols: V—(if O.K.), X—(if adjustment made), O—(repairs needed). List items marked "O" on reverse side with description.

1,000 Mile Inspection

—1. Body—Inspect top, sides, doors and tarpaulins for leaks.
—2. Brakes—See that parking brake operates.
—3. Brakes—Test service brakes on road test.
—4. Fifth Wheel—Upper or Lower Half—Examine jaws, plates and bolts.
—5. Floor—Examine for cracked boards.
—6. Lights—Examine all lights and reflectors inflectors including wiring and plugs.
—7. Pintle Hook and Safety Chains—Inspect.
—8. Examine vacuum or air lines for leaks. If unit equipped with air—bleed and drain reservoir.
—8a. Inspect Landing Gear Drop Legs.
—8b. Inspect Landing Gear Radius Rod Pin.
—8c. Inspect Landing Gear Radius Rod Pin for Cotter Pin Locks.

2,000 Mile Service

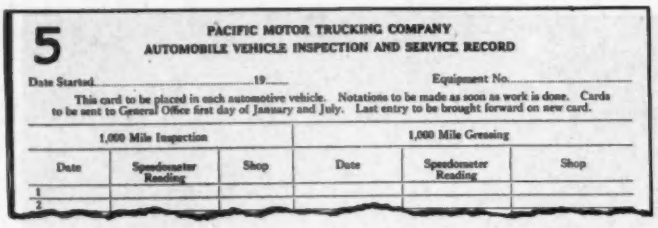
—9. Boosters—Fill B-K Brakemor or Detroit Boosters with ½ pint SAE 20 or 30 engine oil.

5,000 Mile Service

—10. Brakes—Adjust.
—11. Chassis and Body—Tighten all bolts.
—12. Fifth Wheel—Inspect hold down bolts and coupler jaws—clean.

10,000 Mile Service

—13. Wheels—Tighten front and rear wheel nuts.
—14. Brakes—Examine drums and lining.
—15. Shackle Bolts—Examine.
—16. Spring Seats—Radius Rod Brackets—Examine for cracks.
—17. Wheel Bearings—Inspect, clean and repack with wheel bearing grease.



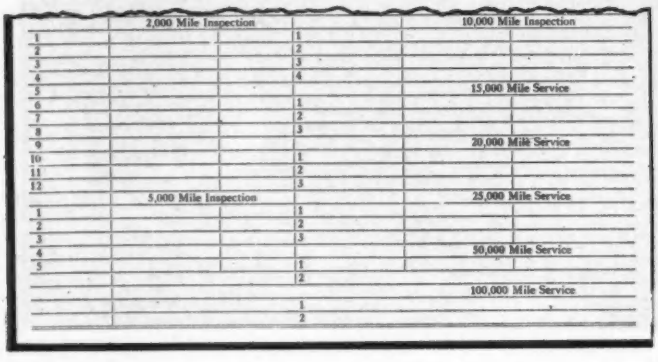
5

PACIFIC MOTOR TRUCKING COMPANY
AUTOMOBILE VEHICLE INSPECTION AND SERVICE RECORD

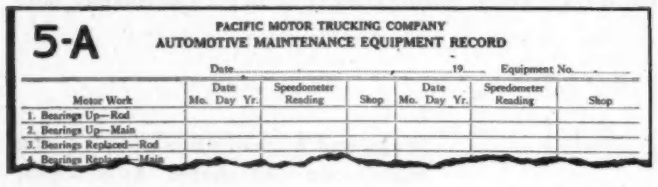
Date Started..... 19..... Equipment No.....

This card to be placed in each automotive vehicle. Notations to be made as soon as work is done. Cards to be sent to General Office first day of January and July. Last entry to be brought forward on new card.

1,000 Mile Inspection			1,000 Mile Greasing		
Date	Speedometer Reading	Shop	Date	Speedometer Reading	Shop
1					
2					



2,000 Mile Inspection			10,000 Mile Inspection		
1			1		
2			2		
3			3		
4			4		
5			15,000 Mile Service		
6			1		
7			2		
8			3		
9			20,000 Mile Service		
10			1		
11			2		
12			3		
5,000 Mile Inspection			25,000 Mile Service		
1			1		
2			2		
3			3		
4			50,000 Mile Service		
5			1		
			2		
			100,000 Mile Service		
			1		
			2		

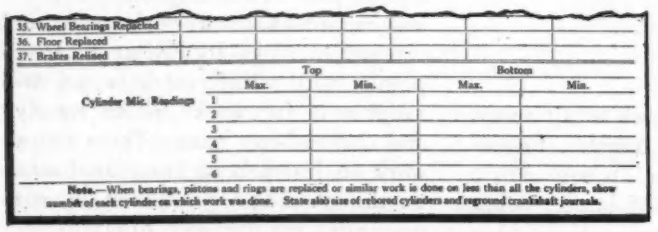


5-A

PACIFIC MOTOR TRUCKING COMPANY
AUTOMOTIVE MAINTENANCE EQUIPMENT RECORD

Date..... 19..... Equipment No.....

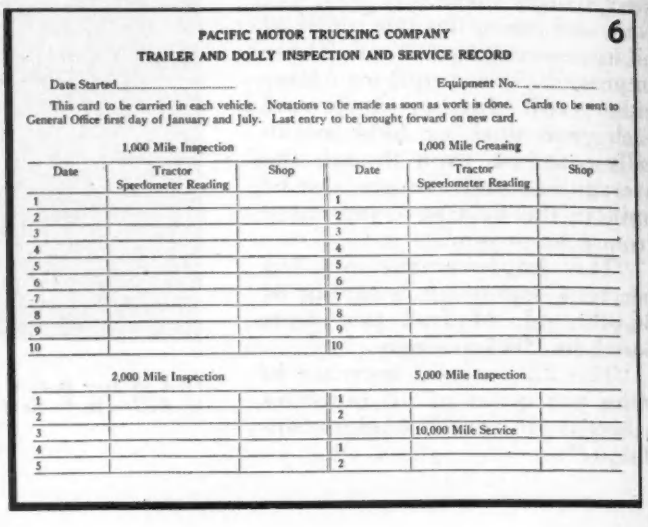
Motor Work	Date Mo. Day Yr.	Speedometer Reading	Shop	Date Mo. Day Yr.	Speedometer Reading	Shop
1. Bearings Up—Rod						
2. Bearings Up—Main						
3. Bearings Replaced—Rod						
4. Bearings Replaced—Main						



35. Wheel Bearings Repacked							
36. Floor Replaced							
37. Brakes Relined							
	Top				Bottom		
	Max.		Min.		Max.		Min.
Cylinder Mic. Readings	1						
	2						
	3						
	4						
	5						
	6						

Note.—When bearings, pistons and rings are replaced or similar work is done on less than all the cylinders, show number of each cylinder on which work was done. State also size of rebored cylinders and reground crankshaft journals.

Left: To insure fool-proof operations of the preventive maintenance program, and to prevent confusion, P.M.T. employs a vehicle card to keep track of inspections and repairs. These cards, 8½x11 in. and printed on manila stock, are carried in each vehicle. One side, Fig. 5, provides an inspection and service record, the other, Fig. 5A, is a record of major repairs. A similiar card, 6½x8 in., is used for trailers and dollies, as shown in Fig. 6. These records are watched closely by the field supervisors. Fig. 7. Portion of the gas and oil record card



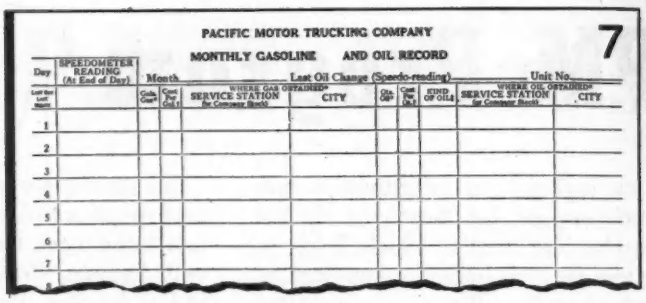
PACIFIC MOTOR TRUCKING COMPANY
TRAILER AND DOLLY INSPECTION AND SERVICE RECORD

6

Date Started..... Equipment No.....

This card to be carried in each vehicle. Notations to be made as soon as work is done. Cards to be sent to General Office first day of January and July. Last entry to be brought forward on new card.

1,000 Mile Inspection			1,000 Mile Greasing		
Date	Tractor Speedometer Reading	Shop	Date	Tractor Speedometer Reading	Shop
1			1		
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
2,000 Mile Inspection			5,000 Mile Inspection		
1			1		
2			2		
3				10,000 Mile Service	
4			1		
5			2		



PACIFIC MOTOR TRUCKING COMPANY
MONTHLY GASOLINE AND OIL RECORD

7

Month..... Last Oil Change (Speedo reading)..... Unit No.....

Day	SPEEDOMETER READING (At End of Day)	Gals. Gas	Cost Gal.	WHERE GAS OBTAINED SERVICE STATION (or Company Stock)	CITY	Qts. Oil	Cost Per Qt.	KIND OF OILS	WHERE OIL OBTAINED SERVICE STATION (or Company Stock)	CITY
Last for Last Month										
1										
2										
3										
4										
5										
6										
7										
8										

P.M.T. FLEET'S PM PROGRAM

(CONTINUED FROM PAGE 65)

prentices, four greasers, four gas men, seven parts men, five clerks and seven lead mechanics who help the other men lay out their work, supervise them and work with them. All these men are under the direction of a shop superintendent. At Tucson we have one foreman, one lead man, five mechanics, two helpers and two greasers; at Fresno, one foreman, one mechanic, one helper and one greaser; at Eugene, one foreman, one mechanic and one helper, and at Lone Pine, one mechanic and one helper.

Our branch shops are equipped to handle practically all work except such jobs as grinding crankshafts. turning brake drums, etc. We are planning, however, to install such equipment where its use can be justified.

In handling emergency road repairs due to breakdowns and accidents, if the unit can be repaired readily on the road, we send a man from our own shop or a nearby commercial shop. If it can't be done that way, we send equipment to remove the load and bring the disabled truck in; either to our own shop or to a commercial garage.

Most of our workmen are all-around mechanics, but we have specialists at Los Angeles for motor rebuilding, electrical repairs, carburetor work, and machining, as well as diesel mechanics for diesel engines.

The war has disrupted our forces, of course. Right now we could use at least 15 good mechanics in our Los Angeles shop alone. We lost a large part of our original force there and have not been able to replace all of them. In Los Angeles we work in three shifts, one from 8 a.m. to 5.30 p.m., another from 4.30 p.m. to 12.30 a.m. and the graveyard shift from midnight to 8 a.m.

PM Periods

Our preventive maintenance program has been in effect since 1934, and is operated on a mileage basis. We have certain routine inspections and services provided for, with forms for guidance and recording results, at intervals of 1000, 2000, 5000, 10,000, 15,000, 20,000, 25,000, 50,000, and 100,000 miles.

At every 1000 miles each driver brings in his truck, and certain of these inspections, or services, are carried out; based on the mileage run by the vehicle. The driver is required to watch the mileage and bring the vehicle in at the proper time. That is part of his job.

(TURN TO PAGE 100, PLEASE)

Col. J. Monroe Johnson, new ODT director, right, being greeted by ATA President Ted V. Rogers. The wide smiles are those of D. H. Gilhousen, right, and John M. Akers, new chairman and vice-chairman of Safety and Operations Section

Present Problems and Post-War Prospects

Discussed at Spring Meeting of American Trucking Associations. New ODT director speaks frankly in first talk to operators

by EARL J. WINTER

STATEMENTS by ODT officials headlined the fifth annual spring meeting of the Safety and Operations and Business Development Sections of the American Trucking Associations, Inc., in Cincinnati on May 8, 9 and 10. Discussions at the various sessions centered around safety, driver training, manpower, rubber, post-war problems and post-war prospects. About 400 persons attended the meetings.

Praising the transportation industry for wartime achievement, Col. J. Monroe Johnson, director of the Office of Defense Transportation, said there is no intention of government operation of carriers.

Col. Johnson declared that "if the motor people can't run the trucks and if the railroad industry cannot run the railroads, they won't be run."

The ODT chief, making his first public address since appointment to succeed the late Joseph Eastman, promised that ODT would exert every effort to help the industry in its problems.

"I am in this to do things for you that you can't do yourself," he said. "But don't expect me to wipe your nose for you."

He promised his agency would extend every aid to help solve truck operators' problems and asserted that adjustment of the "squeeze" between freight rates and increased costs was "a challenge to the ingenuity of the trucking industry. I'm sure you'll find a way out."

Regarding the lifting of restrictions, he said: "When we know without doubt that the invasion of continental Europe is rolling successfully, then we'll talk about lifting restrictions. Until then we'll keep a tight rein."

Col. Johnson termed the men of the truck industry "soldiers too" and declared that the men who keep the trucks operating deserve "a medal just the same as the boys on the front lines."

Asking for the helpful suggestions and recommendations of members of the trucking industry, Col. Johnson said that the ODT wants "to work with the industry."

"If your suggestions are good we'll try to put them into practice," the ODT director said. "If your suggestions are not good, you'll be hearing from us, too."

In an aside in his talk Col. Johnson declared that "some in business feel that government should be run like business. And some curly-headed boys in government believe that business should be run like government. Both are wrong. If business were run like government, it would soon go busted. And if government were run like business, the officials would not be reelected."

And then he quipped: "A statesman that can't be elected isn't worth a damn."

Harold C. Arnot, director of the ODT Division of Motor Transport,

(Turn to Next Page, Please)

(CONTINUED FROM PAGE 69)

said that difficulties in motor transportation are "no different than the entire economy of America as everybody is hit hard and there is nothing we can do to make it any easier as this is war."

"In times like these," he continued, "the real incentive for transportation must be the welfare of the nation," adverting to the fact that many truck operators were operating at a loss.

"The gap between operating costs and revenue is closing," he remarked in stressing the need for continued strides in good management efficiency.

Discussing the gasoline situation, Mr. Arnot said that the major worry was to "have gasoline" and not be ambitious for "octane rating" as 2 out of every 3 tons of cargo dispatched overseas is petroleum product.

Through the activities of "joint action" plans, Mr. Arnot disclosed that a total saving of over 200 million miles a year is the goal: 60 million miles in farm vehicles; 126 million miles in other private carrier operation and 30 million miles in for-hire carrier service. There are 1877 operators in "joint action" plans now with a 40,000 potential, he said.

On the subject of manpower, Mr. Arnot said that men in the older groups should be left in industry.

Expressing belief that with the advent of warm weather the tire situation is likely to become "worrisome," he admitted that "we have no trouble yet but we are all worried." No assurance of sufficient quantity and below-standard quality were cited as reasons predicating "worry."

Mr. Arnot also declared that "government is to be in this business longer than some of you think," quoting the late Joseph Eastman, who told the American Economic Association prior to his death: "the role of government, while it will shrink after the war is over, will continue, I believe, to be considerably greater than it was before the war and problems of tremendous scope and difficulty will be involved."

Mr. Arnot indicated that plans for "better post-war motor truck transportation" should be developed around closer coordination between factories, distributors and operators.

Post-War Problems

Post-war developments pertaining to the nation's commercial trucking interests supplied the theme-note for one of the sessions.

Leon Henderson, former OPA director, headlined the session with a strong plea that "fast action be taken on the U. S. post-war problems" lest the nation, at the end of the war, "be caught with its pants and plants down."

In his "post-war prospects" discussion, Mr. Henderson stressed the "business problem" list requiring legislative action:

1. War contract termination and settlement.
2. Disposition of surplus war commodities.
3. Foreign trade and foreign trade financing.
4. Taxation and federal budget-balancing.
5. Unemployment, out-migration of war workers and expanded social security.
6. Disposition of Defense Corporation war plants.
7. Price, priority and commodity control.
8. The peace.

He asserted that there must be clarification of the conflict between the Congress and the administration on how the nation will solve problems of transition and face the post-war era.

He indicated that Congress will probably "duck" these issues because "the pending presidential election will not produce a majority sufficiently heavy for a clear-cut mandate on acute post-war business problems."

He admitted that appraisal of the contract termination matter awaited "results of the invasion" as the military is retaining a control on certain types of industry to insure artillery superiority.

Mr. Henderson declared that what to do about the government-owned war plants was a thorny problem.

"Whether to sell, lease or hold these plants must await decision on our dominant economic philosophy" and "the same goes for our future policy and the method of handling foreign trade."

As to the peace, Mr. Henderson suggested "settle the boundaries first" and "then have the conferences on aviation, shipping, labor standards, cartels and raw materials."

Post-War Prospects

Following Henderson's address, there was an illustrated paper by J. C. McWilliams, director of ATA department of research, on "Transportation in the Post-War Period."

Mr. McWilliams declared that the truckmen's problem questions of post-war are: (1) Will my company get enough freight? (2) Will competitive conditions permit us to haul it profitably?"

He declared that 35,000,000 American families are deciding now what truck operators will haul after the war.

He listed the anticipated consumer money available for demands thus: automobiles, $3,307,500,000; household appliances, $1,215,910,000; home furnishings, $711,410,000; new homes, $7,184,800,000; home-farm improvements, $7,500,000,000.

"On the basis of these anticipated expenditures for items named, transportation revenues aggregating $1,750,000,000 are indicated, premised on past records," he said.

In 1939 these same commodities yielded transportation revenues of less than $600,000,000 or 34 per cent of "anticipation" for the after-war era, he reported.

Mr. McWilliams also reminded that new avenues propelling the trucker's interest in divers ways revolve around frozen food, air cargo, prefabricated homes, plastics, chemicals, dehydrated foods, aluminum and even television.

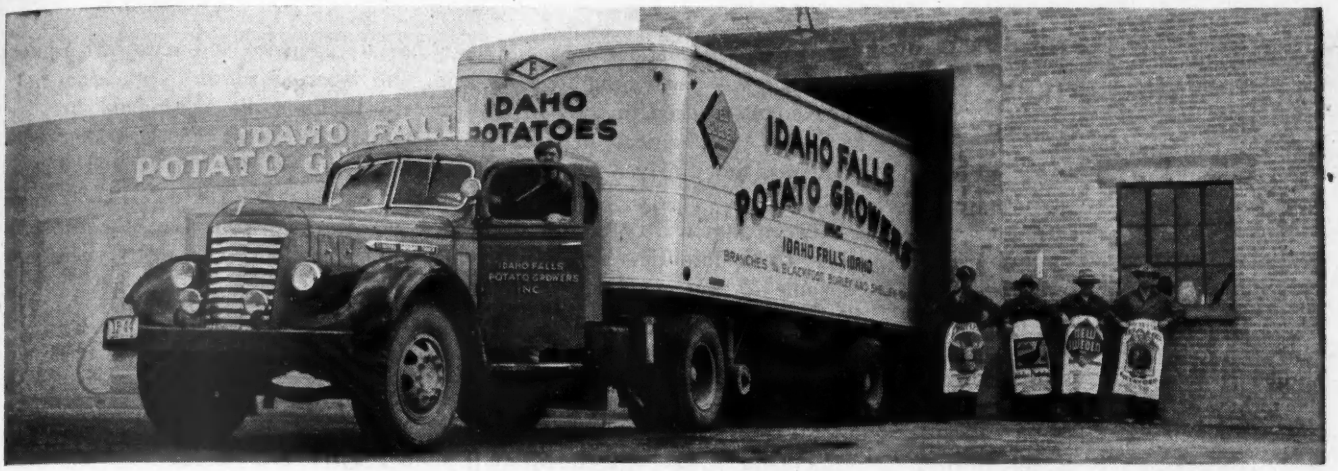
Manpower

During another assembly the manpower situation, reemployment and rubber problems supplied the themes.

Ray H. Atherton, general manager of ATA, declared that the industry's manpower situation is "bad and will get worse before it gets better." He attributed the situation largely due to the inroads of the draft.

Roland M. Rice, general counsel of ATA, speaking on "Responsibility of Employers for Reemployment of Returning Veterans" said "this reemployment program is the responsibility of industry" and urged motor carriers "to go all out in finding placements for veterans."

(TURN TO PAGE 72, PLEASE)



Valvoline helps in Idaho's food-fight for freedom

NEW SWEDEN BRAND

IDAHO FALLS POTATO GROWERS
Incorporated
P. O. BOX 978
IDAHO FALLS, IDAHO

Nov 24, 1943

WAREHOUSES
IDAHO FALLS
BLACKFOOT
SHELLEY
BURLEY

Valvoline Oil Company
Attention: Geo. F. Peterson
Portland, Oregon

Dear Mr. Peterson:

We have been 100% satisfied with the lubrication of Valvoline Oil in 17 trucks used in our potato marketing work, and 3 tractors and 2 trucks in general farming operations for the past three years.

The lubrication is checked regularly when we examine the motors at overhaul times. Valvoline is strictly uniform in its dependable quality. We market about 4,000 carloads of potatoes fresh and make about 5,000,000 pounds of dehydrated potatoes for the armed forces annually. You can realize how important Valvoline is in our maintenance program, particularly in our comparatively isolated position.

Sincerely yours,

IDAHO POTATO GROWERS, INC.

F. L. Hansen

By F. L. Hansen,
General Manager

"Valvoline's Dependable Quality is Particularly Important in our Comparatively Isolated Position"

says

IDAHO FALLS POTATO GROWERS, INC.

From the rich volcanic-ash soil of Idaho it's a long haul to market . . . the crop must be taken to Salt Lake City, Portland, Seattle, and sometimes greater distances. So the Idaho Falls Potato Growers see that their trucks get the best of care—and that means *Valvoline* protection.

Whether your fleet is big or little, diesel or gasoline powered—Valvoline lubricants will give you trouble-free extra mileage. Valvoline Fleet Laboratory Service will give you impartial engineering analysis of your requirements—write your nearest Valvoline office *today*.

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REFINERY IN PENNSYLVANIA

COSTS MORE TO MAKE—COSTS LESS TO USE

VALVOLINE

The 1st Pennsylvania Oil

PRESENT PROBLEMS AND POST-WAR PROSPECTS

(CONTINUED FROM PAGE 70)

Tires

Walter W. Belson, assistant general manager of ATA and director of rubber research, told the conference that "unless the Office of the Rubber Director acting jointly with the military forces, the ODT and the OPA can make available a substantially larger quota of large-size tires in the third quarter than has been allocated each month up to now, a serious difficulty confronts the industry."

He stated that in the smaller sizes, below 8.25x20, not too much trouble is in sight because the supply of these tires is more plentiful and their mileage performance is substantially better than the larger tires.

Mr. Belson asserted that "tire quality as reported by many carriers is scarcely better than 50 per cent of pre-war quality based on tire mileage."

"Although the Office of Rubber Director disputes these figures," Mr. Belson said, "and although the attempts to indicate that lessened mileage may be due to abuse including high speed and overloading, it appears to us that the figures are as cited."

He also disclosed that "because of quality and recent boosts in price due to the 6½ per cent OPA-authorized increase and the application of the 12 to 15 per cent higher rayon ceilings to the total truck tire output, tire cost to the industry has soared." Since April 1, 1944, the juggling of the price structure alone has resulted in increases as high as 25 per cent—without reference to quality, Mr. Belson said.

Safety

G. R. Wellington, chief, Section of Safety of the Bureau of Motor Carriers, Interstate Commerce Commission, told the conference that the 1943 record "indicates the recognition on the part of motor carriers of the importance of safety in keeping themselves in business and continuing without breakdown the indispensable contribution they have already made to war transportation."

He asserted, however, that joint cooperation of management and labor alike was paramount to reversal of accidents caused directly or indirectly by mechanical defects, fire accidents, and "driver asleep" accidents.

Between January, 1942, and March, 1944, truck fatalities have dropped off some 40 per cent, Mr. Wellington disclosed; and that "overall property damage has been about 50 per cent higher for the two years of the war than it was for the two years prior to the war."

Accidents caused directly or indirectly by mechanical defects, Mr. Wellington termed "alarmingly on the increase, with 1943 showing an increase over 1942 of nearly one-third. The first two months of 1944, compared to corresponding months of 1943, on basis of incomplete reports showed an increase of 28 per cent.

While brake failures have decreased, rise in accidents caused by tire, engine and spring failures have risen, he pointed out.

Of accidents caused directly or indirectly by tire failures, Mr. Wellington reported 29 per cent due to failure of recapped tires, one-third to failure of new tires or ones in "apparently good condition" and 16 per cent involving tires which had smooth treads but which had not been recapped.

Fire accidents are increasing, the speaker said, with a 38 per cent increase recorded in 1943 over the preceding year.

Urging precaution, Mr. Wellington said "unless this is done we may expect our fire accident situation to grow worse, especially as we face a still more unfavorable situation with the increased use of synthetic tires because of the greater likelihood of synthetic tires to overheat."

A 100 per cent jump in "driver asleep" accidents was reported from January to December, 1942, and a study of 1943 to September shows the situation continued to grow worse, Mr. Wellington reported. He recommended that motor carriers maintain "closest watch on fitness and hours of work of the drivers."

Pyke Johnson, president of the Automotive Safety Foundation, who followed Mr. Wellington on the program, declared "the total traffic toll is of such proportion that the problem demands recognition by appropriate agencies and requires prompt and vigorous action by government." He disclosed that during the first 25 months of World War II, traffic accidents in continental United States totaled 54,000, of which 32,000 were war workers, and that the injured victims added up to nearly two million.

Driver Training

William Frigon, of Fred Olson & Son Motor Service, Chicago, addressing the conference on "Personnel Selection and Training Procedure Under Wartime Difficulties" said "the most important step in our driver training program is the selection of the men to be trained."

Relating his experiences with the Olson company, Mr. Frigon said the fundamental objectives in their training program have been: "Reduction of accidents and lower maintenance costs, which, if achieved, automatically raise productivity."

In choosing drivers, Mr. Frigon disclosed, "we attach a great deal of importance to the applicant's general attitude, courteousness, attentiveness, amiability, personal appearance, educational background and general knowledge." He said the plan was based on use of supervisor instructors, who are former drivers, not necessarily the older men, and who have been taken from the ranks and given extensive job-instruction training.

"We have found that the plan of supervisor instructor works best when using one supervisor for not more than 25 drivers," he said.

"Ingenuity in Maintenance and Repair" was the subject of a talk by Morris Greenberg, Werner Transportation Co., which will be published in detail in the July issue.

Other speakers were Joseph T. Meade, Mack Mfg. Corp.; A. Ewing Greene, Mason & Dixon Lines; Walter Schumacher, Schumacher Motor Express; Arthur C. Horrocks, Goodyear Tire & Rubber Co.; James G. Hayden, Associated Transport, Inc.; M. A. Jones, Federal Bureau of Investigation.

At a business session D. H. Gilhousen of Norwalk Truck Lines, Norwalk, O., was elected chairman of the Safety and Operations Section, and John M. Akers, of Akers Motor Lines, Inc., Gastonia, N. C., was named vice-chairman.

How to get uniformity in your national fleet

EVERY ONE OF YOUR TRUCK BODIES CAN HAVE THE SAME DISTINCTIVE LINES, THOUGH BUILT IN DIFFERENT SHOPS . . . NATIONAL SERVICE ORGANIZATION ASSURES QUICK DELIVERY, FAST, LOW-COST MAINTENANCE.

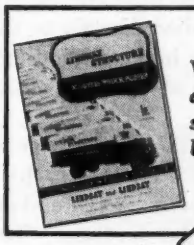
Lindsay Structure, with its "pre-tensed" sheets, achieves great strength and lightness.

Truck bodies of Lindsay Structure, modern method of light steel construction, are identical when built to master specifications—even though assembled in different plants. Branches of your fleet may operate from a dozen different cities—yet the same style Ls bodies can be constructed for you in each. All Ls parts are die-formed, die-rolled, die-drawn, and die-cut to exact dimensions.

Uniformity in a national fleet of Ls bodies greatly reduces maintenance and replacement costs. Parts for Ls are interchangeable and readily available; profitless lay-up time is cut to a minimum, and replacements take less than two man-hours per panel.

In your post-war planning, check the possibilities of Lindsay Structure. Bodies of Ls—light, strong, and modern in appearance—are available in any desired size and style. Warehouses located at key points throughout the nation will assure quick delivery for your post-war needs.

Write for information. Send drawings, data, or blueprints to **Lindsay and Lindsay, Adams-Franklin Building, Chicago 6, Illinois; or 60 East 42nd Street, New York 17, New York.**



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DISTRIBUTORS AND DEALERS THROUGHOUT THE COUNTRY

Lambert Disc Brake for Motor Vehicles

STEMMING from a development program and field service operations over a period of some 12 years, the Auto Specialties Mfg. Co., St. Joseph, Mich., is offering the Lambert Disc Brake to the industry for applications in current production and as an important development for consideration in post-war vehicle design.

At the present writing, the Lambert principle has been established on a practical basis by virtue of its adaptation in large volume production as a countershaft brake for major tractor manufacturers. Many thousands of these units have been delivered during the war and these requirements continue unabated.

The Lambert disc brake is based upon a design principle applicable to the gamut of automotive and industrial applications. It is offered for use on passenger cars, on buses, on trucks, on tractors, and for power take-off for automotive and industrial use. Depending upon the nature of the job, it may be used in single-disc or multiple-disc arrangements. Moreover, power application is available in any desired form—mechanical, hydraulic, or air. As will be evident from an examination of typical drawings shown here, power is applied directly to the power plate of the brake without resorting to the use of external mechanism or linkage.

The general principle of operation is illustrated in Fig. 1 which shows the single-disc, countershaft mechanical brake for tractors. The power plate is the fixed element, incorporating the return springs, the actuator lever or means of power application, as well as a series of power inserts and power rollers. Movement of the actuator lever, which fulcrums on two balls, causes a corresponding movement of the actuator plunger, thus forcing the primary disc into contact with the middle ring and lining assembly. It may be noted that the middle ring assembly has freedom of endwise movement on the shaft splines. As contact is established between the primary disc and the middle ring, braking action is effected by contact of the linings with the primary disc and the stationary element of the housing.

Braking action is amplified and controlled by self-energizing action. Referring to Fig. 1, it will be noted that the power insert consists of hardened discs fitted in the power plate and primary disc, suitably formed to hold the power roller. As the primary disc comes in contact with the middle ring, it tends to rotate slightly either clockwise or counterclockwise, depending upon the movement of the vehicle, or shaft. This displacement in either direction changes the relative positions of the power inserts, causing the roller to move up on the inclined surfaces of the power inserts. This action, in turn, increases the displacement between the power plate and primary disc with a consequent increase in pressure on the middle ring.

This energizing action is proportional to the intensity of braking effort required. In this connection it may be noted that, depending upon the type and size of brake, the power inserts are provided either with rollers or balls. It is obvious that the application of braking effort is always multiplied by the energizing action of the power insert element.

Fig. 2 shows a production axle brake employing hydraulic actuation through two hydraulic pistons which are interconnected for equalization. Here the piston takes the place of the mechanically-operated actuator lever shown in Fig. 1. In this arrangement, there is a secondary disc bolted to the power plate, forming a self-contained housing in which the surface of the secondary disk offers the braking surface for the outer lining. This is a special case of hydraulic application. The general type is known as the Collarfram hydraulic, featuring a single, large

Fig. 1

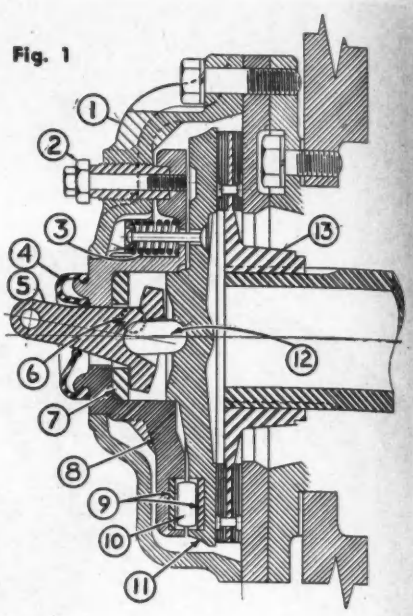
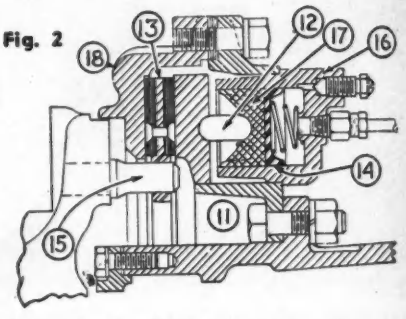


Fig. 2



Legend—1—Brake housing, 2—adjusting screw, 3—return spring, 4—enclosure boot, 5—actuator lever, 6—actuator balls, 7—actuator lever washer, 8—power plate, 9—power inserts, 10—power roller, 11—primary disc, 12—actuator plunger, 13—middle ring and lining assembly, 14—hydraulic seal, 15—drive stud, 16—hydraulic cylinder housing, 17—cylinder piston, 18—secondary disc

diaphragm applying pressure uniformly through a multiplicity of contact points on the primary disc.

The arrangement for air brake actuation features a continuous diaphragm, as in the case of the Collarfram hydraulic brake, suitably connected to the reservoir tank and valve. The pressure of the diaphragm is transmitted through a pressure plate connected to the primary disc.

The energizing action of both the hydraulic and air brakes is exactly the same as described for the mechanical brake.

The manufacturer claims that the Lambert brake system offers smooth, powerful braking action in a relatively smaller and lighter unit; lighter rotating parts; simplicity of installation and relative ease for servicing.

GOOD IDEA . . . FROM AWAY BACK . . .

It isn't hard to build a truck. But it's mighty hard to build a truck to match a Mack! And there's a reason. Back in 1900, John Mack set out to build the best truck in the world. His very first Mack stayed in service 17 years. Today we go forward with his same idea—backed by all we learned along the way. Big or little—heavy or light—no matter what type of Mack you own, you can be sure you'll get your money's worth in *work*. That's what "Built like a Mack truck" means. And the record says it means it *more* with every passing year.

Mack

TRUCKS

FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.

IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!

CCJ QUIZ

by ROBERT F. BAHL

Correct Answers on Page 87

Everyone knows how American trucks are fighting on the battlefronts all over the world. This month's CCJ Quiz brings out a few of the important tasks being performed by trucks at home. With a credit of ten points for each correct answer, see how high you can score. Answers on page 87.

1.

This little piggy went to market. And the chances that he made his trip to the stockyards in a truck are . . .

a. 1 out of 10 c. 1 out of 2
b. 2 out of 5 d. 7 out of 10

2.

All of these companies are doing a grand war job at home. All of them are big operators of trucks. One of them operates the largest fleet of trucks in the world.

a. Bell Telephone Co.
b. Continental Baking Co.
c. National Dairy Products Co.
d. Standard Oil Co. of Indiana

3.

You probably know that 43.3 per cent of the total communities of the nation rely entirely upon trucks for transportation of goods and commodities. Can you say, though, whether the number is . . .

a. on the increase?
b. on the decrease?
c. just about stationary?

4.

One of the nation's biggest headaches in World War I was transportation. Sharply contrasted is the splendid job being done by today's haulers. To what extent trucks have made the difference is indeterminable, but we do know that for every truck registered in 1917, the number at the start of this war was . . .

a. three c. fifteen
b. eight d. one hundred

5.

Backbone of the war's transportation has been the "for hire" trucking system. "For hire" trucking has grown into an industry with a yearly income of . . .

a. $50,000,000 c. $500,000,000
b. $200,000,000 d. $2,000,000,000

6.

Come sleet, snow or ice, highways must be kept open. Specially designed snow removal trucks keep the roads clear for war materials to pass to their destination. Practically a necessity for these snow removal trucks is . . .

a. a diesel engine
b. an extra capacity cooling system
c. air brakes
d. light weight

7.

One reason for the extremely short wheelbases on most coal delivery trucks is to enable them to operate better on congested and narrow city streets. Another reason is . . .

a. some states limit the length of coal trucks very stringently
b. the shortness of many coal-weighing scales
c. most customers want their coal delivered in small lots
d. less danger of overturning under a heavy load

8.

Was the glass of milk on President Roosevelt's breakfast table transported by truck? Well, the percentage of milk coming into Washington, D. C., by motor truck is . . .

a. 50 per cent c. 90 per cent
b. 75 per cent d. 100 per cent

9.

Which of these home front industries would most likely be using trucks with six-man cabs?

a. Long distance hauling
b. Road building
c. Garbage collection
d. Utility companies

10.

With trucks carrying about half of all fruits and vegetables today, one of these states has recognized the value of trucks in getting produce to the big cities speedily. The state government has set up 30 markets with facilities for truck transportation as meeting places for farmers and buyers. The state is . . .

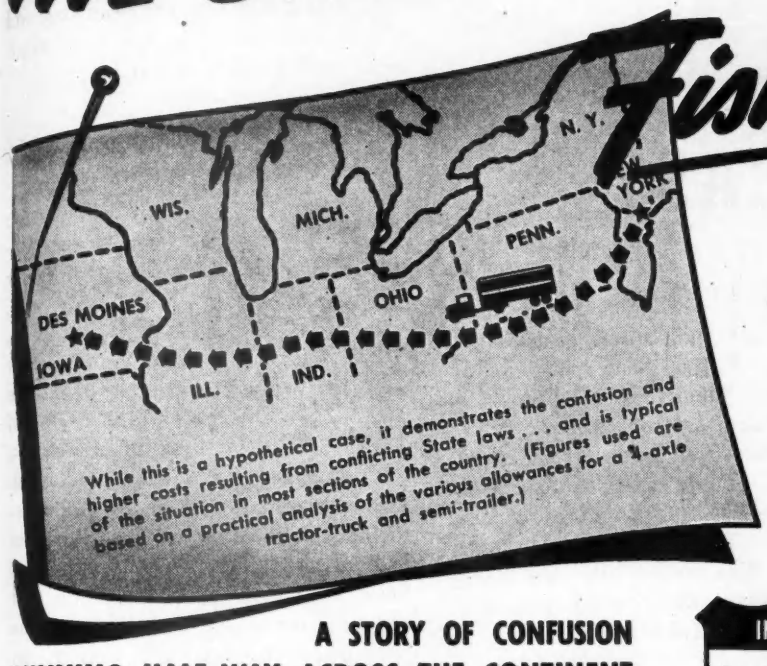
a. California c. Iowa
b. Florida d. Washington

Cleveland Pneumatic Tool Celebrates Fiftieth Anniversary

This month the Cleveland Pneumatic Tool Co., Cleveland, Ohio, is observing the fiftieth anniversary of its founding. Incorporated in Ohio on May 29, 1894, as the Union Electric Co., the corporate name was changed in 1899 to the present one, and facilities were concentrated on the development and distribution of pneumatic appliances.

In Hollywood for the premier showing of The Electric Auto-Lite Co.'s new animated, technicolor training film, "The Right Spark Plug In The Right Place," produced by Walt Disney Studios, were, from left, H. D. Bissell, advertising manager, J. A. Shank, parts and service division manager, and, right, Frank Nealon, spark plug division sales manager, who conceived the original idea for the film and supervised its production. They dropped in on Auto-Lite's weekly coast-to-coast radio show, "Everything For The Boys," starring Ronald Colman, who is shown above with Ingrid Bergman, guest star of the evening

THE STRANGE CASE OF THE Fish Shipment



While this is a hypothetical case, it demonstrates the confusion and higher costs resulting from conflicting State laws . . . and is typical of the situation in most sections of the country. (Figures used are based on a practical analysis of the various allowances for a 4-axle tractor-truck and semi-trailer.)

A STORY OF CONFUSION RUNNING HALF-WAY ACROSS THE CONTINENT

A passenger car is about to leave New York City . . . destination Des Moines. The automobile owner, with his driver's license and State license tag, knows that he can travel unmolested over the highways of the seven States en route. . . . A Truck-Trailer operator hauling a load of fresh ocean fish consigned to Des Moines is also ready to leave New York. His route is through the same States as the passenger car. But here is the difference . . . . **NEW YORK** permits him to use a 50 ft. Truck-and-Trailer unit, with a gross weight of 50,000 lbs. including vehicle and load. He starts out . . . . Upon entering **NEW JERSEY** he is permitted a length of only 45 ft. and a gross weight of 60,000 lbs.—his equipment is 5ft. too long, but 10,000 lbs. **underloaded** . . . . **PENNSYLVANIA** presents a bigger problem—a 45 ft. length limit and only 45,000 lbs. gross weight—5,000 lbs. less than New York, 15,000 pounds less than New Jersey. That's not all, for he must also pay the State of Pennsylvania an 8 mills-per-dollar gross receipts tax on that part of his total mileage traveled in the State. . . . Assuming that he were permitted to travel on to the **OHIO** line—again his Truck-Trailer is 5 ft. over-length, while his vehicle is 6,000 lbs. **underloaded.** And here he has to register with the Public Utilities Commission and pay a fee of $72 . . . . In **INDIANA** the length restriction is still 5 ft. less than in New York, but the weight allowance is 3900 lbs. more. However, another payment is to be met, this time a $24.00 charge for obtaining operating authority from the Indiana Public Service Commission . . . . Now, into **ILLINOIS**—and serious trouble—the gross weight must be cut 10,000 lbs. and the vehicle length slashed 15 ft., one-third less than the majority of States. And he must pay a special gross weight tax of approximately $245.00 . . . . Upon arriving at the border of **IOWA** he is 5 ft. overlength, but **underweight** 3,900 lbs. Here he discovers that if he is to make regular runs, he must buy an annual Iowa compensation tag, costing $250.00!

NEW YORK
Gross Wt. 50,000 lbs.
Axle Wt. 22,400 lbs.
Vehicle Length 50 ft.

NEW JERSEY
Gross Wt. 60,000 lbs.
Axle Wt. No Restriction
Vehicle Length 45 ft.

PENNSYLVANIA
Gross Wt. 45,000 lbs.
Axle Wt. 20,000 lbs.
Vehicle Length 45 ft.
Special Mileage Tax

OHIO
Gross Wt. 56,000 lbs.
Axle Wt. 18,000 lbs.
Vehicle Length 45 ft.
$72.00 P. U. C. Registration

INDIANA
Gross Wt. 53,900 lbs.
Axle Wt. 18,000 lbs.
Vehicle Length 45 ft.
$24.00 P. S. C. Fee

ILLINOIS
Gross Wt. 40,000 lbs.
Axle Wt. 16,000 lbs.
Vehicle Length 35 ft.
$245.00 Weight Tax

IOWA
Gross Wt. 53,900 lbs.
Axle Wt. 18,000 lbs.
Vehicle Length 45 ft.
Weight Tax Up to $250.00

All of these restrictions and conflicting requirements take dollars out of your pocket! You eat the food and use the goods brought to you by Trucks and Trailers from all over the country. And the higher delivery cost resulting from unfair State taxes and lack of uniformity in State laws is in the price you pay.

FRUEHAUF TRAILER COMPANY ◆ **DETROIT 32**
World's Largest Builders of Truck-Trailers *Service in Principal Cities*

Know how your State stands! Do you live in a "bottleneck" State, or is it "bottled" up by adjoining States? Send for our booklet, "Are the United States United?" (third edition) or ask your Fruehauf Branch for one.

FRUEHAUF Trailers
"ENGINEERED TRANSPORTATION" REG. U. S. PAT. OFF.

Highway Users Give Congress Views on Post-War Highways

Five national highway users organizations have filed with Chairman J. W. Robinson (D., Utah), of the House Roads Committeee, a joint statement of policy on post-war highway development, including:

1. Agreement on the need for a Federal-aid post-war highway program.
2. Assertion that present State highway user tax rates "are more than adequate" to meet the costs of "necessary post-war highway facilities."
3. Insistence that "ability to pay" is of utmost importance.
4. Denial of statements that highway users will not oppose additional taxes if the revenue therefrom is used for roads.
5. Opposition to non-highway use of highway revenues.
6. Unalterable opposition to toll road proposals.
7. Declarations that highway users already are paying more than their fair share of highway costs.
8. Recommendations that the Federal Government retire from the motor vehicle tax field emphasizing repeal of the motor vehicle "use tax."

The statement was signed by the American Trucking Associations, Inc., National Council of Private Motor Truck-Owners, Inc., American Automobile Association, National Association of Retail Druggists and The National Grange.

Mack Makes Four Major Sales Division Appointments

Four major sales department appointments have been announced by F. F. Staniford, president of Mack-International Motor Truck Corp. E. F. Vreeland, formerly district manager of the Bronx and White Plains, N. Y., has been named manager of the Albany, N. Y., branch in Mack's Northeastern Division. M. J. Chollet has been appointed district manager of the St. Louis, Mo., branch, while C. L. McLure now heads the Louisville, Ky., branch. Cone T. Bass meanwhile has taken over duties as division bus manager of Mack's Central Division.

Diesel Fuel Correction

Referring to the Diesel Fuel Specifications Table, CCJ April, 1944, please note the following correction. On specifications for Gulf Oil Corp., it is to be noted that the fuels are distributed both by Gulf Oil Corp., and the Gulf Refining Co. On Gulf Diesel Fuel No. 2 and No. 1T, the maximum carbon residue content is based upon a "10 per cent bottoms test method," making this value actually lower than with the straight test method usually employed.

Illinois Simplifies Procedure for Overweight Permits

The chief engineer, State Highway Division, State of Illinois, has reported to Highway Branch, Sixth Transportation Zone Office, that requests for temporary or permanent permits by motor carriers to transport war material on over-sized or over-weight equipment across the highways of Illinois beyond the standards agreed to by the War Department and the Council of State Governments, are increasing considerably.

In order to expedite requests for permits of this nature, an agreement has been reached whereby highway transport operators requesting coverage for the transportation of war materials within the State of Illinois should contact Major Alex Baxter, chief, Highway Branch, Sixth Transportation Zone, U. S. Army, 201 N. Wells Street, Chicago 6, Ill., directly, who will investigate the need for, and clear, requests before the chief engineer's office takes action.

Autocar Reorganization Eyes Future Developments

BACHMAN

In anticipation of future developments, The Autocar Co., Ardmore, Pa., has made a few changes in the top brackets of its management. C. A. Borton, vice-president in charge of manufacturing, is devoting all his attention to quality control. This function has been explained as "embracing but not confined to the normal functions of inspection. In this matter, an

BORTON

GELPKE

executive who is entirely independent of any other responsibilities, and who is reporting directly to the president, will have charge of all elements that enter into insuring the desired quality in our production, from the time designs and specifications are released by the engineering department to the operation of the vehicle in the customers' hands."

Succeeding Borton as production manager is A. Gelpke. Formerly chief engineer, he will have charge of all functions of production.

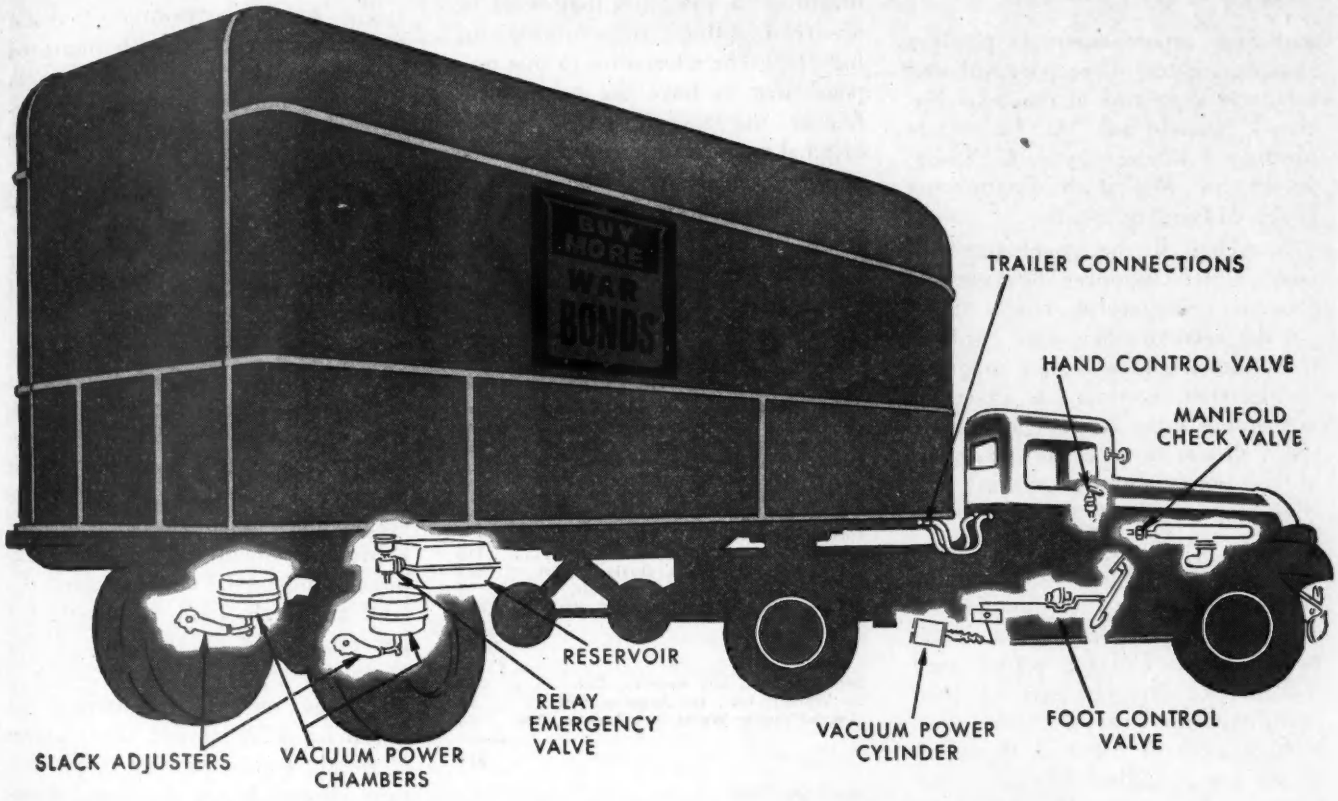
B. B. Bachman, vice-president in charge of engineering, will complete the three-man team operating on a level directly under the president, and responsible for the product.

Link Diesel Progress With Supercharger Development

Parallel development in a coordinated program of both diesel engines

(Turn to Page 80, Please)

Absolute Control for All Loads, on All Roads!



MIDLAND VACUUM POWER BRAKES

IMPORTANT FEATURES in MIDLAND VACUUM BRAKES

- ★ Simple in design—rugged in construction.
- ★ Tremendous braking power in reserve.
- ★ Thoroughly and carefully engineered and tested.
- ★ Interchangeable in fleet operation.
- ★ Less lining wear—fewer brake adjustments.
- ★ Factory rebuilt exchange plan.

Today's heavy loads and strict delivery schedules make Midland Vacuum Brakes a greater asset than ever. The absolute control provided by Midland's exclusive, fully compensating control valves stops any load—quickly—safely—easily.

Midland Vacuum Brake Kits are designed and engineered especially for all popular makes of trucks. Safeguard your equipment, and your delivery schedules, by giving your trucks the dependable protection of Midland Vacuum Brakes. Specify Midland when ordering new vehicles.

THE MIDLAND STEEL PRODUCTS CO.
10605 MADISON AVENUE, CLEVELAND 1, OHIO
Export Department: 38 Pearl Street, New York City

MIDLAND
CHRISTENSEN
POWER BRAKES

CCJ NEWSCAST

(CONTINUED FROM PAGE 78)

and their superchargers to produce smaller, lighter, more powerful diesels, was suggested at the SAE National Diesel-Fuels & Lubricants Meeting in Chicago by E. W. Wasielewski, of McCulloch Engineering Corp., Milwaukee, Wis.

Speaking at the concluding session, Chief Engineer Wasielewski presented comparative charts showing the relative efficiencies resulting from diesel engine design progress. He declared the time has come for integrating superchargers with high-speed diesels to take full advantage of their potentialities for making possible more compact and lighter engines.

High supercharger efficiency is of greater importance in the high-speed engine than in the low-speed diesel, he explained, and the future need will be for superchargers of high performance at larger pressure ratios. Further work is required to permit of the use of higher manifold pressures and rotational speeds, he added, and supercharger development must be carried out at the same time to insure maximum progress.

Truck-Trailer Manufacturers Favor Surplus Repurchase

The directors of the Truck-Trailer Manufacturers Association met May 10, in Washington, to discuss industry and association problems.

Among the reports submitted by the various committees previously appointed was a report submitted by Harvey C. Fruehauf, chairman of the Committee on Disposal of Excess Military Trailer Equipment. Mr. Fruehauf's report recommended that the manufacturer of the equipment be given the first opportunity to repurchase, and further that if the manufacturer in question does not choose to repurchase, the equipment then be offered for sale only to other trailer manufacturers or to bona fide dealers or distributors representing a trailer, motor truck, or automobile manufacturer.

It was further recommended that if the number of military trailers to be disposed of by the government was greater than could be immediately absorbed by the civilian market, the government should hold the military trailers in a pool and release them back through the original manufacturer in quantities that could be absorbed without demoralizing the industry. The alternative to this proposal was to have the government finance the trailers taken by the original manufacturer until such time as these vehicles could be resold in the civilian market.

1944 Third Axle Allocations

The Truck Branch of the Automotive Division of the War Production Board has made public revised allocations of third-axle attachments for 1944. The allocations follow:

DRIVING TYPE	
Gear Driven	
Baumis-Warford Co., Inc., Townsend, Mass.	115
F.A.B. Mfg. Co., Inc., Oakland, Cal.	263
Grice 2 Axle Drive Co., Detroit, Mich.	96
Thornton-Tandem Co., Detroit, Mich.	2,672
	3,146
Chain Driven	
Cook Brothers, Los Angeles, Cal.	267
Six Wheels, Inc., Los Angeles, Cal.	54
Superior Trailer Works, Los Angeles, Cal.	50
	371
TRAILING TYPE	
Cook Brothers, Los Angeles, Cal.	55
F.A.B. Co., Inc., Oakland, Cal.	84
Fruehauf Trailer Co., Los Angeles, Cal.	222
Hendrick Mfg. Co., Poughkeepsie, N. Y.	21
Langlois Brothers, Los Angeles, Cal.	16
Little Giant Products, Peoria, Ill.	142
Six Wheels, Inc., Los Angeles, Cal.	55
Superior Trailer Works, Los Angeles, Cal.	36
Trailer Co. of America, Cincinnati, Ohio	56
Truck Equipment Co., Inc., Buffalo, N. Y.	329
Trucktor Corp., Newark, N. J.	840
Utility Trailer Mfg. Co., Los Angeles, Cal.	231
Weber Trailer & Mfg. Co., Los Angeles, Cal.	80
	2,167
GRAND TOTAL	5,684

Fred H. Haggerson, vice president and director of Union Carbide and Carbon Corp., has been elected president, succeeding Benjamin O'Shea, now chairman of the board

Robert B. Davis, since 1939 general manager of the Raybestos Division, was elected a vice president of Raybestos-Manhattan, Inc.

Carriers' Financial Status Ebbs on Year-to-Year Trend

The financial position of motor freight carriers in March improved somewhat over the previous month this year, but extended an unfavorable year-to-year trend in evidence for months past.

This is disclosed in figures released by American Trucking Associations, and based on reports from 331 motor carriers in 44 states and the District of Columbia.

The compilation showed that the March ratio of operating revenues to expenses was 96.7 compared with 98.8 for February and 93.7 for March of last year. Revenues for March inched 0.5 per cent above a year earlier and gained 9.2 per cent over February. Meanwhile, March expenses climbed 3.7 per cent above the level of March, 1943, to a point 6.9 per cent ahead of February of this year.

Figures on March tonnage released by ATA showed that volume of freight transported by motor carriers slipped below the level of the corresponding month in the preceding year for the first time since September, 1940.

The decline was trifling, only 0.3 per cent, and a continued high rate of activity was indicated by a gain of 10.4 per cent over February of this year, which, however, contained two less working days than in March.

Reports received by ATA from 355 motor carriers in 47 states and the District of Columbia showed that those trucking lines transported an aggregate of 2,906,229 tons in March, 1944, compared with 2,632,966 in February, 1944, and 2,915,788 in March, 1943.

The ATA index figure, computed on the basis of the average monthly tonnage of the reporting carriers for the three-year period of 1938-40 as representing 100, figured out at 187.50 for March, compared with 173.01 for the previous month.

R. G. Martin Auto-Lite Chairman

Royce G. Martin, president of The Electric Auto-Lite Co., has been elected to serve also as chairman of the board of directors of the organization. He succeeds the late C. O. Miniger, who died April 23.

More News in Back Pages

26 BASIC DESIGNS

—the correct ring for every piston groove in every engine in your fleet

PERFECTION is the goal of Sealed Power engineers. "Almost right" won't do for your fleet. That's why they have developed not 2, not 6, but 26 basic designs of piston rings for use in Individually Engineered Ring Sets. The rings in each set are specifically engineered to do the best possible job in a particular type and make of engine. Sealed Power has been refining these sets for more than five years—has been producing rings for car, truck and engine manufacturers more than 30 years. Repowering with Sealed Power motor parts insures best results. Sealed Power Corporation, Muskegon, Michigan and Windsor, Ontario.

Piston Rings, Pistons, Cylinder Sleeves, Piston Pins, Valves, Water Pumps, Bolts, Bushings, Tie Rods, Front End Parts

SEALED POWER PISTON RINGS

BEST IN NEW TRUCKS! BEST IN OLD TRUCKS!

ODT, OPA & WPB NEWS

Trucks Under 12,000 or Specially Designed, Exempt

Small and specially designed motor trucks operating in over-the-road service are exempted from orders of the ODT requiring registration of empty or partially loaded trucks, under general permits announced by the ODT, effective immediately.

The permits (General Permits ODT 3, Revised 5A, and ODT-17-14A) extend the relief formerly provided by similar permits under the Joint Information Office program, which was replaced by the new Traffic and Vehicle Registration program.

The exemption from the registration provisions was granted on the condition that such vehicles be loaded to capacity while operated over a considerable portion of the outbound or inbound route traveled in the over-the-road operation involved. The carriers are required to use "due diligence" in maintaining capacity loads.

"Small and specially designed trucks" are defined by the ODT as those which can be utilized only for the transportation for which they are especially designed and not for transportation generally, or those whose primary carrying capacity is occupied by built-in loading racks, trays or crates designed for the loading of specific property, or those whose rated load-carrying ability does not exceed 12,000 lb.

Training Urged to Bridge Fall Manpower Shortage

Anticipating a more serious manpower shortage in the automotive maintenance industry next fall, the ODT has again directed ODT maintenance advisory committees throughout the country to urge shop and garage owners to organize classes of present and prospective employes, men and women, to study maintenance and repair work.

The training program for automotive maintenance mechanics is being conducted at the local level by public vocational training schools under the sponsorship of the United States Office of Education, at the request of the ODT.

Private Carriers May Trip-Lease Trucks to Each Other

Private motor truck owners may trip-lease their vehicles to other private truck operators without applying first to ODT District Offices. This provision of ODT's orders, along with various others, has been clarified in a series of questions and answers pertaining to the registration of freight and trucks with ODT district offices under the provisions of Administrative Order ODT 10. In the answers to questions, it is specifically stated that "if, without resorting to the district office for information with respect to empty trucks registered by private carriers, a private carrier is able to conclude a lease of a truck from another private carrier which will further the purpose of the general order, it may do so."

Although an ODT district manager may not "direct" that an empty truck registered by a private carrier be leased to another private carrier, he is "required" to give to any private carrier information as to empty trucks registered by private or contract carriers upon inquiry. This point is covered in Questions 4 and 5.

Another answer declares that the leasing of a vehicle does not make the private carrier lessor a "contract carrier," and that the leasing of vehicles by private operators is not required if contrary to regulations of State authorities.

Dow Assistant Director

Fayette B. Dow has been named assistant director of the ODT in charge of liquid transport. Mr. Dow has been in charge of petroleum transport for the ODT from the beginning. The division coordinates the movement of petroleum and other liquids by rail, waterway, tank truck and pipeline.

Clark Leaves ODT

William J. Clark resigned as ODT regional director for Region 1, with headquarters in New York City, effective May 10. Mr. Clark has resumed his former activities as an officer and director of Highway Express Lines, Inc., and Clark-Callahan, Inc., Philadelphia.

Prins ODT Information Chief

Charles E. V. Prins has been appointed information director for the ODT. Mr. Prins, whose home is in Connecticut, went to ODT after nearly two years as information program manager for the OPA.

Connors Succeeds Beyer

E. J. Connors has been appointed director of the ODT's Division of Transport Personnel, succeeding Otto S. Beyer, who resigned effective May 15. Mr. Connors will be on leave from the Union Pacific Railroad, where he is vice-president in charge of operation.

Florists Save 19 Million Gals.

The nation's 20,000 florists saved more than 290,000,000 vehicle miles in the delivery of flowers and plants in 1943 as compared with the prewar year, 1941, a reduction of 58 per cent, according to a report submitted by the National Florists Advisory Council to the ODT. The report was based on an independent survey conducted for the council by a private fact-gathering organization. The industry's operating mileage was reduced from approximately 518,000,000 vehicle miles in 1941 to about 228,000,000 miles last year, with a consequent saving of about 19,000,000 gallons of gasoline.

New Tires for Light Trucks

The OPA has further broadened the eligibility for new passenger car tires to include (1) all light delivery trucks, and (2) all motorists using their cars for occupational driving under "B" or "C" ration books. At the same time motorists holding the basic "A" ration book

(Turn to Page 84, Please)

● Summer . . . and the heat is on! And hot weather is tough on any motor—especially a sludge-clogged one. Casite cleans out sludge and gum, fights engine-varnish, and refreshes lagging horsepower.

A clean motor runs better, lasts longer, and uses less fuel. A clean motor runs cooler and smoother. Use Casite in the crankcase oil and through the carburetor as directed . . . to keep operating costs down.

THE CASITE CORPORATION • HASTINGS, MICHIGAN

What Casite Does

- It quickly cleans out harmful sludge deposits.
- Retards the formation of engine varnish.
- Frees sticking valves and rings.
- Makes starting easier—even in zero weather.
- Helps oil flow smoothly and constantly to close tolerance areas.
- Gives better and smoother performance.

CĀSITE

CLEANS OUT MOTORS
KEEPS MOTORS CLEAN

IT'S A PRIVILEGE... ...TO BUY WAR BONDS

ODT, OPA and WPB NEWS

(CONTINUED FROM PAGE 82)

and heretofore unable to purchase any tires, new or used, were made eligible for the small remaining stock of used passenger tires. This action, the result of a substantial increase in civilian allocations of new passenger car tires by the Office of the Rubber Director, was taken in Amendment 76 to OPA's Ration Order 1A, effective May 1.

Deferment Procedure Set Out in WPB Pamphlet

In response to thousands of employers' requests for advice and assistance in dealing with Selective Service procedures, the WPB Office of Manpower Requirements has prepared a concise summary of the steps which an employer should take to obtain full consideration for deferment of essential employes.

The new publication, entitled, "Advice to Employers Regarding Selective Service Procedures," emphasizes the various steps which an employer must take through local and state Selective Service channels before WPB can undertake to assist in cases of key employes.

The publication explains the bases for occupational deferments, the special procedures affecting registrants under 26 years of age, local and state Selective Service board procedures, and the use of replacement schedules.

AFL-CIO Committee Makes Recommendations to WPB

At a meeting with the War Production Board on April 27, the AFL-CIO Labor Committee presented ideas having to do with the preservation and maintenance of the nation's transportation facilities. Stated briefly they are:

1. Relaxation of WPB's "L" orders on spare parts, batteries and garage equipment to insure an adequate supply of repair parts and facilities to keep existing trucks and buses in good repair.

2. Establishment of reconditioning centers in various parts of the country where assembly line methods could be applied to the repair of thousands of vehicles.

3. Transformation of standby war plants into such reconditioning centers for both military and civilian cars, thus keeping intact the labor force of the plants in case a future resumption of war production is required.

4. Establishment of OPA ceilings on auto repairing and for used cars; that priorities be given war workers for the purchase of used cars, and that the supply of used cars be channeled into regions where a great demand exists.

5. Initiation of a program to make civilian trucks and buses meet essential transportation needs.

"Hydrovac" for Essential Users

Formerly "rationed" because military demands absorbed the bulk of production, "Hydrovac" brakes, a new one-unit system of vacuum power braking, can now be delivered in quantity to qualified users, it was disclosed today by Frank B. Willis, automotive sales director of the Bendix Products Division of Bendix Aviation Corp.

QUIZ ANSWERS

CCJ Quiz on Page 76

1. d. 7 out of 10. As America entered the war, 70.5 per cent of the hogs coming into the nation's stockyards were transported by truck. In addition, 68.9 per cent of all the cattle, 67.5 per cent of the calves, and 34.3 per cent of the sheep and lambs came by motor transport. Trucks are carrying their load on the food front, and more.

2. a. You rang the bell if you picked the telephone company. The Bell System operates an estimated 18,200 trucks in addition to 4800 passenger cars . . . all of them helping to keep the wires open and speed the war's end.

3. a. It is increasing yearly. Just 10 years ago there were 48,000 communities without rail facilities of any kind. Today that number has gone up to 54,453.

4. c. Fifteen to one. There were 326,000 trucks registered in 1917; 4,876,054 in 1941. There are less railroad freight cars today than there were in World War I.

5. d. Two billion dollars, half of which goes for equipment, fuel and parts, the other half for labor, management, taxes, depreciation, and profit.

6. b. Snow removal trucks present cooling problems that are not encountered in the ordinary vehicle. They run at low speeds, from 8 to 12 m.p.h., putting most of the operation in second or third gear. Moreover, the snow plow in front tends to shut off some of the air flow. As a result, the water capacity must be increased. Fans are usually driven with double belts, and may be shrouded to make them more efficient.

7. b. Many coal-weighing scales are carry-overs from the days when coal was delivered in horse-drawn wagons, and they do not permit of any too great length for the trucks. As early as 1909, special short wheelbase trucks were developed for coal delivery.

8. d. 100 per cent. Washington and 19 other large cities in the United States receive their total milk supply by truck. Among those cities are Detroit, Los Angeles, and St. Louis. In 1930, only 6 per cent of the milk coming into metropolitan markets arrived by truck. Ten years later, more than 62 per cent was coming in by truck. It is estimated that there are about 100,000 trucks in use in the milk and milk products industry.

9. d. Back in 1937, special cabs which would accommodate a whole crew of six men were first developed for utility companies. Previously, crew members had to ride in the body of the truck, where they were subject to the danger of falling tools, etc.

10. b. Florida. From a single market five years ago, there are now thirty all over the state. One of the largest is at Pompano, where more than 20 carloads of produce move out daily. Wartime waste is intolerable, so perishable products must be transported speedily. Trucks are the answer.

Simplex Wins "E" Award

Simplex Products Corp., Cleveland, Ohio, was awarded the Army-Navy "E" for excellence in the production of Simplex Piston Rings for the armed forces.

NEW PRODUCTS

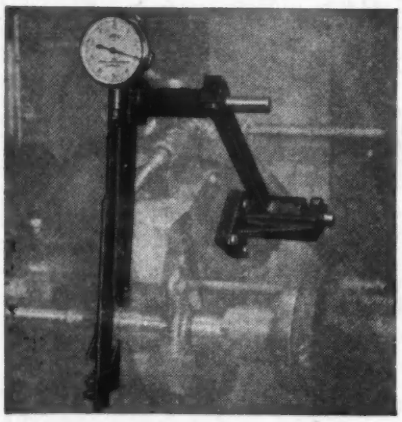
(CONTINUED FROM PAGE 59)

P227. Visual Grinding Gage

Here is a visual grinding gage said to provide accuracy in precision grinding operations while materially increasing the speed of such work.

Known as the Stuart Micromatic Gage, it is applied to and taken off the work while the machine is in operation. Hand miking is eliminated. The dial indicator guides the operator as the work is ground to size. The gage indicates the correct size even though the sizing controls of the machine may be worn.

According to the manufacturer, grinding tolerances of plus or minus .0001 in. are easily maintained. The dial is actuated by direct parallel thrust. Contact points of the caliper measuring bar are of tungsten carbide for long wear. Made in two



models, the gage has ranges of 1/8 in. to 1¼ in. and 5/8 in. to 2½ in., respectively. Additional calipers for the larger model provide ranges of 2 in. to 5 in. and 5 in. to 8 in., respectively. The Stuart micromatic gage is distributed exclusively by Clawson & Bals, Inc., Chicago, Ill.

Use Free Postcard For More Details.

P228. Graphite Stick

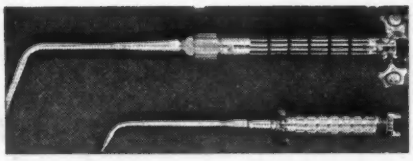
Slipstik, a new medium-soft, wax-like graphite lubricant in handy solid form, has just been introduced by Joseph Dixon Crucible Co., Jersey City, N. J.

Fast rub-on lubrication and ease of application are features of this all-around graphite lubricating stick. It is enclosed in a 3x7/8-in. cylinder. Each end is provided with a disc. By pressing one disc inward, the stick is ejected to the required length for application. After using, the other disc is placed on top of the exposed stick and pushed inward. It is said to adhere lastingly to metal, wood, fibre, leather and all hard and soft materials.

Use Free Postcard For More Details.

P229. Lightweight Torch

A compact lightweight welding torch, especially designed for aluminum, various alloys and all other sheet metal up to ¼ in. in thickness.



It is made by the National Cylinder Gas Co. as a part of its new Torchweld line of welding and cutting equipment.

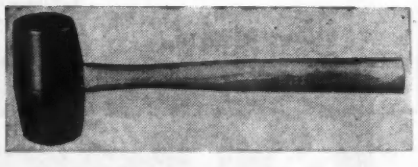
Weighing only 8 4/5 oz., complete with a commonly used size of tip, this torch, called the Aircrafter, has an overall length of less than 12 in. The handle is 7/8 in. in diameter and only 4⅛ in. long.

This torch is designed for delicate, precision work in "hard-to-get-at" light metal work. Two styles of copper tips, both producing soft, medium-pointed flames that give deep penetration without blowing hot metal, are offered, and both can be swiveled to any position. Tip head for screw-in style tips is made of special heat-resistant cupro-nickel. Mixers incorporate the patented non-flash principle.

Use Free Postcard For More Details.

P230. Shock Absorbing Mallet

A new no-mar mallet has just been introduced by Taylor Mfg. Co. This mallet has the HI-EFF head—a special shock absorbing material that hits hard without hurting.



The new HI-EFF mallet comes in three weights: 12 oz., 18 oz., and 24 oz.—but the heads are of the same size and no weighted cores are used. This outstanding feature makes for better balance, greater compactness, easier use and longer life.

Use Free Postcard For More Details.

P231. Water Pump Hub Puller

The New Britain Machine Co., New Britain, Conn., has just introduced two new models of water pump hub pullers. One of these, Fig. 1, has been designed especially for Chevrolets and some G.M. pumps using pressed steel pulleys. The manufacturer claims that with this pulley it is impossible to bend these pressed steel pulleys when pulling the water pump, because of the closeness of fit between the bored hole on the underside of the puller and the steel hub in the center of the pulley. Thus, the tendency to pull sidewise is checked.

The lower illustration, Fig. 2, shows the universal model designed to service all other water pumps, except Fords. The flanges on the underside are designed to prevent the puller from teetering while making it fast to

Fig. 1

Fig. 2

the pump, and to keep the base always at right angles to the pulley, enabling its removal with a straight upward pull. The flanges are said to provide another advantage in that the mechanic is able to see that the center screw is lined up with the pump shaft.

The bases of both models are made wider than the pulleys so that the pullers can be held in the vise after they have been applied to the pump. A priority rating of AA-5, or higher, is required for the purchase of these tools.

Use Free Postcard For More Details.

P232. Protective Skin Cream

The B. F. Goodrich Co., Akron, Ohio, is introducing two protective skin creams developed in its laboratories and said to be suited to fleet

(TURN TO PAGE 90, PLEASE)

NEW PRODUCTS

(CONTINUED FROM PAGE 88)

maintenance conditions. One of these creams is of the dry type and, the other, wet type.

The dry cream is of an improved type which has been made as nearly neutral to the skin as possible. These properties eliminate skin drying or any tendency to cause burning or irritation even under prolonged usage.

Use of the dry cream protects exposed portions of the body against dirt, grease, grime and any other hard-to-wash-off substances. The company claims that it provides maximum protection and safety.

The cream for wet use is made for protection of the skin where water and other dilute aqueous and mild chemical solutions are present.

Both the wet and dry types leave the skin soft and smooth even after the cream is removed. Both have been constantly tested under regular operating conditions in the company's factories, with many gallons being used each week by employes.

Use Free Postcard For More Details.

P233. Round Tool Bits

Round tool bits, made either from Stellite 98M2 or Stellite Star J-Metal alloy, are furnished by Haynes Stellite Co., a unit of Union Carbide and Carbon Corp., Kokomo, Ind. These round tool bits are furnished centerless-ground to tolerances of plus 0.000 and minus 0.002 in. on the diameter, and plus or minus 1/16 in. on the length.

Stellite round tool bits are used on turning or boring operations, or can be ground into drills or reamers. They possess the same red hardness, edge strength, toughness, and abrasion resistance as Stellite square and rectangular tool bits. Tool bits of 98M2 are made for faster machining of steel; Star J-Metal has long been used for machining cast iron, malleable iron, bronze, brass, aluminum, and some steels.

Use Free Postcard For More Details.

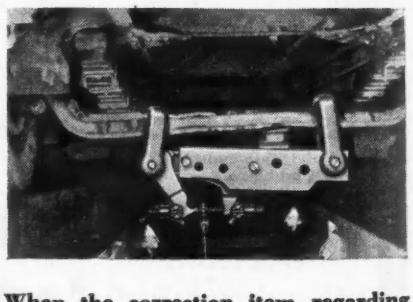
END

(Please resume your reading on P. 60)

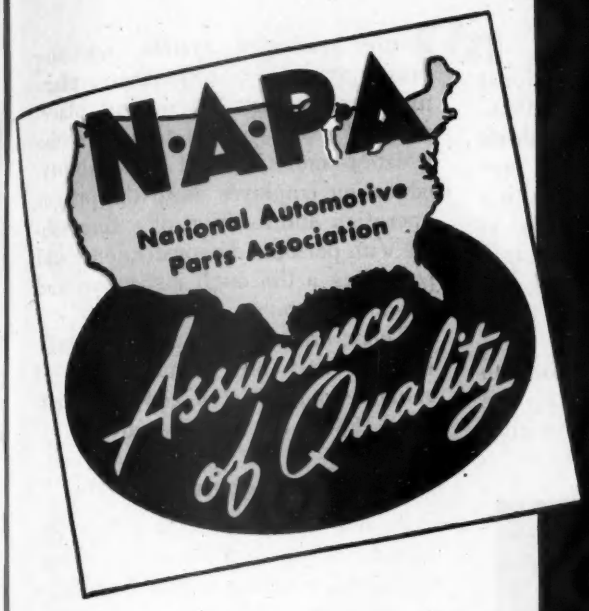
Philadelphia AP Warehouse Now Under Factory Control

A factory-owned and operated warehouse for AP mufflers, exhaust pipes and tail pipes has been opened at 631-35 N. 19th St., Philadelphia, Pa., it was announced by John Gallagher, sales manager of the AP Parts Corp., Toledo, Ohio.

Ed Berdan is in charge.



When the correction item regarding the Manbee Equipment Co. advertisement in our April issue was inserted on Page 70 of our May issue, there was not sufficient time to make a cut for use therewith. The illustration above, correctly positioned, shows the Manbee Portable Axle Straightener applied to an axle. One of the important advantages claimed for this device, which is made by the Manbee Equipment Co., 408 South Kolmar Ave., Chicago 24, Ill. is that it is not necessary to remove the axle from the vehicle in order to straighten it



PROBLEM

Youv'e **always** got jobs in the shop. You **never** have enough time or enough mechanics. But these jobs **have** to get rolling!

They all need parts—**good** parts—parts you can depend on to go in right—to stand up in service.

How can you get 'em the quickest?

ANSWER

There's a jobber near you who has parts for all types of vehicles—parts which bear the NAPA Seal. This gives you complete assurance of their quality.

If the parts you need are commonly needed parts, he can give them to you right away. If not, he can call on the nearest NAPA Warehouse, and get overnight delivery, or better, from complete master stocks of more than 50 essential lines. No waiting for "shipment from the factory."

This jobber, like more than 1800 others in every section of the United States, is part of the country's largest independent parts organization. That's why . . .

American Brakeblok · BALKAMP · TRICO · DUCKWORTH · Allied WISCONSIN · ECHLIN · Spicer · DOUBLE DIAMOND · PURITAN · FEDERAL · RARITAN · Buffalo · DETROIT · MicroTest · Allied RAYMOND · MARTIN-SENOUR · Belden · DITTMER · BROWN LIPE · Allied PRECISION · O · UNITED · CELORON · Allied A.P.C. · STANDARD · MONMOUTH PRODUCTS · New Britain · Allied GRAPHO

Your NAPA Jobber is a Good Man to Know!

NATIONAL AUTOMOTIVE PARTS ASSOCIATION • DETROIT, MICHIGAN

FREE LITERATURE

(CONTINUED FROM PAGE 58)

their manpower. Revised federal regulations provide certain restrictions with which fleet operators should become acquainted.

This eight-page bulletin outlines the various provisions, and suggests a three-point program for the safety, health and general well-being of such employes. A free copy is available by writing L182 on the free postcard.

L183. Fire Fighting Manual

"One of the reasons our national fire loss amounts to over $300,000,000 a year is that few people think about fighting a fire until they face one," points out a new, interesting booklet entitled, "Sharpshooting at Flames". With trucks, tires, building materials, etc., hard to get—if not impossible—this booklet ought to be studied by all fleet operators.

The booklet gets right down to cases and deals specifically with the problem of fighting fires, organizing a fire protection system, selecting proper types of extinguishers, planning proper distribution and placement of extinguishers to insure the greatest mobility and accessibility, educating employes as to the proper operation and location of extinguishers with periodic demonstrations, and providing a thorough inspection and check-up system.

There are only 16 pages, 8½x11 in., but they are crammed full of valuable data. Get a copy by writing L183 on the free postcard.

L184. Brake Booster Bulletin

A new bulletin has just been released dealing with the construction, operation, installation and advantages of employing a brake power booster.

The data points out how, by the employment of the booster, the power of any hydraulic brake can be tripled. In addition to the text, a number of large illustrations, some in three colors, show how this can be accomplished.

A copy will be mailed to any fleetman who marks L184 on the free postcard.

END

(Please resume your reading on P. 59)

Fleet Wartime Problem Courses Offered at Northwestern

Courses in driver training, commercial vehicle fleet problems, traffic engineering, school bus problems, and others, are being offered at Northwestern University, Evanston, Ill., from June 19 to June 30. Each course will be developed to cover current wartime problems of an emergency nature and the post-war difficulties that are certain to come.

The courses will be conducted by nationally known authorities of many years' experience in their respective fields. All sessions will be held in the university's new Technological Institute building.

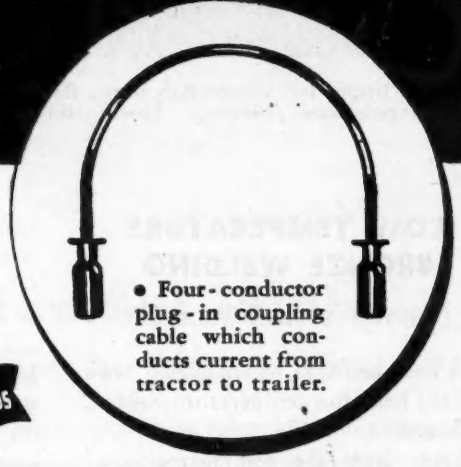
AAC Officers Re-elected

All officers of the Automotive Advertisers' Council were re-elected for the 1944-45 year at the semi-annual meeting held in Hot Springs, Va. They are: president, Russell W. Case, Jr., Thermoid Co.; vice-president, T. Faxon Hall, Walker Mfg. Co.; Secy.-treas., Carl B. Dietrich, Wagner Electric Co.

On Jeeps or Largest Trucks

WARNER COUPLING SOCKETS GIVE Unmatched Service

Specify the Original Warner Coupling Socket



• Four-conductor plug-in coupling cable which conducts current from tractor to trailer.

• The Warner Coupling Socket is serving all the way up the line — from the tiny jeep to the largest truck used by our armed forces.

For years, this proved-in-service socket has been standard equipment on many tractor-trailer fleets — used with our plug-in coupling cable to conduct current from tractor to trailer for brakes, tail light, stop light and running lights. To these standard functions, a wartime requirement has been added—blackout lights.

This sturdy socket is simple in construction—a heavy bakelite lining securely encased in steel, plated to resist rust. Contacts are provided for four separate circuits.

Although the needs of our armed forces come first, we can still supply Warner Electric Brakes and equipment if you are on the essential list.

WARNER ELECTRIC BRAKE MFG. CO.
BELOIT, WISCONSIN

BUY WAR BONDS

WARNER
ELECTRIC BRAKES

Fig. 11. This differential housing repair illustrates the means used to neutralize the strain unrelieved by pre-heating. Detailed explanation is given in the text

Fig. 12. Upper left illustration shows flange after bronze welding. Upper right: Same repair after blasting. Lower illustrations show under side of flanges

LOW TEMPERATURE BRONZE WELDING

(CONTINUED FROM PAGE 54)

iron base metal to which it had been surface heat, low temperature welded, or brazed.

Aside from the demonstration of the strength of this weld, shown by the tenacious grip it has on the cast iron, the most important point to be observed is that the housing did not crack during the application of the heat in these several spots, or when cooling, or when the hills were struck free from their hold on the cast iron. At no time did the heat spread; in fact, the piece could be handled without gloves.

This experiment should give a definite idea of the surface heat, low-temperature bronze welding of cast iron method used on all of the jobs to be described hereafter.

Having satisfied ourselves that the bronze will hold onto a properly prepared surface of cast iron, we use it on many jobs similar to this upper cast iron crankcase, shown in Fig. 4.

The only preparation given this particular job, in addition to steel grit blasting the line to be welded both inside and outside, was to grind out a 90 deg. "V" at the points coming in contact with the lower crankcase and the flange of the bell housing. These two points were finished with a file. The balance of the crack, being unchipped, provided a true metal-to-metal surface along the line of break—the bronze pulling it back into its exact position—and the inside and outside weld balancing, equalizing or neutralizing each other.

The parts were held in true alignment by bolting them to the lower crankcase, and they remained in that position when cold.

Another advantage of using bronze on a job similar to this is the ease with which a mistake in lining up the parts can be remedied. The bronze can be melted away from its base on the cast iron just as easily as it can be applied, the parts reset and the job again bronze welded.

Avoid Use of 90 Deg. Bevel

We have stated that the three times strength of bronze on cast iron may be a hazard, also that pre-heating is a waste of time when bronze welding cast iron. We also include the unrestricted use of the 90 deg. single bevel "V" as an additional hazard. The experience gained from the repair of the truck body hoist housing shown in Fig. 5 will serve as an example. It is the only one of hundreds in use that failed as this one did.

The original break, now covered with bronze, extended from slightly below the top surface to within a few inches of the bottom of the casting. A 90 deg. single bevel "V" close to, but not through the inner wall of the cylinder, was made; avoidance of machine work, if possible, was the aim. Then it was pre-heated to a dark red, bronze welded as shown, again heated to a dark red after welding, and allowed to cool overnight. A reinforcement of at least an eighth of an inch, spread at least a quarter of an inch each side of the chipped surface for additional strength, was provided. "This," we thought, after having followed the recommended procedure, "is a good job."

Within six months the job was back in the shop, cracked as shown by the chipping of the new crack to the right of the original repair. This time the crack ran from the extreme lower end, up across the top, and part way down the opposite side. The expense involved in trying to repair it again caused it to be scrapped.

However, examination of the inside of the cylinder wall showed that one side of the crack had climbed above its opposite side, at the upper end, and below its opposite side on the bottom end. It was not very much to

(TURN TO PAGE 96, PLEASE)

Spicer Transmissions and Universal Joints

speed world traffic in peace and war

Highways and byways throughout the world have been built and kept open with the aid of automotive equipment using Spicer products. Summer and winter, in war and peace, the job of construction, maintenance and snow removal on automotive and airplane traffic lanes has been speeded with dependable Spicer Transmissions, Power Take-Offs, Universal Joints and Axles. Spicer engineering and manufacturing facilities have been important factors in the progress of American transportation, and will be ready to speed peacetime automotive production when the war is won. Spicer Manufacturing Corporation, Toledo, O.

41 YEARS OF Spicer SERVICE

BROWN-LIPE CLUTCHES AND TRANSMISSIONS • SALISBURY FRONT AND REAR AXLES

SPICER UNIVERSAL JOINTS • PARISH FRAMES, STAMPINGS

LOW TEMPERATURE BRONZE WELDING

(CONTINUED FROM PAGE 94)

be sure, a matter of a few thousandths of an inch, but a close look at the photo shows the new crack open also a matter of a few thousandths of an inch.

Experiment No. 2

Now we will re-enact the "crime" with a piece of cast-iron pipe, to determine the cause of the second failure in Fig. 5. The cast iron pipe, held tightly closed in the jaws of a vise, is heated all the way around its inner circumference to a dark red heat, then bronze welded. It is allowed to cool after another all around heating. Now, upon opening the vise jaws, we have an opening a good sixteenth of an inch in width, as shown in Fig. 6.

Repeating the test with another section of the cast iron pipe, we chip a round-bottomed groove, inside and outside, as wide as the pipe is thick, as shown in Fig. 7. Next, after the usual steel grit blasting, we make an unpreheated, surface-heated bronze weld, inside and outside, and allow it to cool on the bench without the aid of the vise to hold it closed.

Now, inspection of the result in Fig. 8 shows that while the crack is visible, its opening has been reduced to a minimum. The inside and outside equalizing welds pull the crack together. Further, the chipping of the round-bottomed groove went only one-third into the thickness of the wall, both inside and outside. The unchipped third served as a resistance to the contracting bronze and helped to maintain the part in true alignment. The round-bottomed groove spread the grip of the bronze over the cast iron surface, as well as the contraction strain. Whereas, in the 90 deg. single bevel "V" the contraction strain was of negative strength at the sharp bottom of the "V", but its cumulative strength at the top of the broad "V" plus the reinforcement of an eighth of an inch on the top surface of the body hoist housing provided too much strength. The fact that the cast iron wall of the hoist tube cylinder gave way and the bronze holding fast also is worthy of some consideration.

Experiment No. 3

That bronze will hold even though under tensional stress can be easily demonstrated with the following test piece of scrap cast iron. It has been prepared with the 90 deg. single bevel "V", surface heat bronze welded, and clamped on a fairly true surface plate, as shown in Fig. 9. After allowing it to cool, we remove the clamps and measure the pull of the bronze.

Now, we will heat the entire section, weld and all, to a dark red heat, and again clamp to the surface plate. When cool again, we remove one of the clamps, as shown in Fig. 10, and get a similar result.

We clamp and unclamp this small test piece a great number of times, and find that bronze weld acts like an elastic hinge; expanding as the high side is pulled down without letting go, and promptly exerting its unrelieved contraction strain or pull when the clamp is released. Inasmuch as this strain, unrelieved by pre-heating,

(TURN TO PAGE 98, PLEASE)

A "LAZY" OIL DID THIS!

. . . keep your engines on the "go" with hard-working TALPEX

THE "SOFTER," heavily loaded bearings encountered today mean oil has a bigger-than-ever job to do.

It's no job for a "lazy" oil. That's what happened to the badly corroded bearing you see above . . . it was lubricated by a "lazy" oil . . . an oil that didn't have *all* of the properties necessary to efficient engine operation.

Guard against this happening to your engines. Use new Shell Talpex . . . the hard-working oil that has *all* the properties needed to operate an engine with utmost efficiency.

NEW SHELL TALPEX

Is Non-Corrosive to alloy bearings. Protects *all* lubricated engine parts against corrosion.

Has Exceptional Oxidation Stability. Holds to a minimum the formation of sludge, lacquer and other deterioration particles.

Has High Detergency. Helps keep carbon lacquer and foreign particles from adhering to pistons and rings, valves, ports.

Has Low Carbon-Forming Tendencies. Reduces ring sticking and wear. Lengthens engine life.

If the oil you now use does not have *all* these properties it's a "lazy" oil . . . should be changed to hard-working Shell Talpex. Ask the Shell man to show you why.

SHELL

TALPEX

THE NEW, ALL-PURPOSE, HEAVY-DUTY LUBRICANT

For trucks, busses, tractors, shovels, stationary and marine Diesels

LOW TEMPERATURE BRONZE WELDING

(CONTINUED FROM PAGE 96)

is a hazard, the means used to neutralize it is shown on the differential housing repair in Figs. 11 and 12.

The broken and missing section of the flange has been replaced with a thicker section of mild steel, champered on both sides and steel grit blasted. The new section was held in position with a ring under the flange, and fixed so that the under surface was slightly higher than the original surface of the housing. Then it was bronze welded on both sides without pre-heating. Then the repair was given another steel grit blasting to show the welds before machining, which consists of facing one side, and drilling new holes. The job was successful, and the housing still is as good as new. No distortion has resulted, and the repair should last until the flange is knocked away by some road obstruction.

General Requirements

Surface heat, low-temperature bronze welding of cast iron, requires, first, the smallest tip or welding head on the torch that will give just enough heat to permit the molten bronze to flow tin and sink into the cleaned cast iron surface. On thick sections this heat does not need to be so closely adjusted, but on thin sections, such as the water jackets of engine blocks, this heat must be held to the minimum, and strictly confined to the area on which the bronze is to be applied. Carelessness in the amount of heat allowed to sink and spread into and outside the weld zone will only result in new cracks.

Inasmuch as the bronze only sinks into the surface a few thousandths of an inch, no good purpose will be served by using an excessive amount of heat.

Surface heat bronze welding also takes into consideration the contraction strains set up by the bronze, in the metal itself, and must be counterbalanced wherever possible with a like amount of bronze on its opposite surface.

On thin sections, where an opposing weld cannot be set up to offset this strain, bronze must be used in as small an amount as possible. In the case of a cracked water jacket, for example, only enough to cover the immediate cracked section to make it water tight. Moreover, it should be applied on an unchipped surface, and spread over the surface to distribute the strain instead of centralizing it, as we would be doing with a 90 deg. single bevel "V". A slightly oxydizing flame is always used, for on some bronze rods it helps to eliminate some of the fumes, as well as decarbonize the surface of the cast iron as the weld is made. The choice of a flame, however, is up to the individual welder.

The 90 deg. single bevel "V" should be restricted to circumferential welds where it does its best work, and causes no hazard.

END

(Please resume your reading on P. 55)

Felt Products Expands

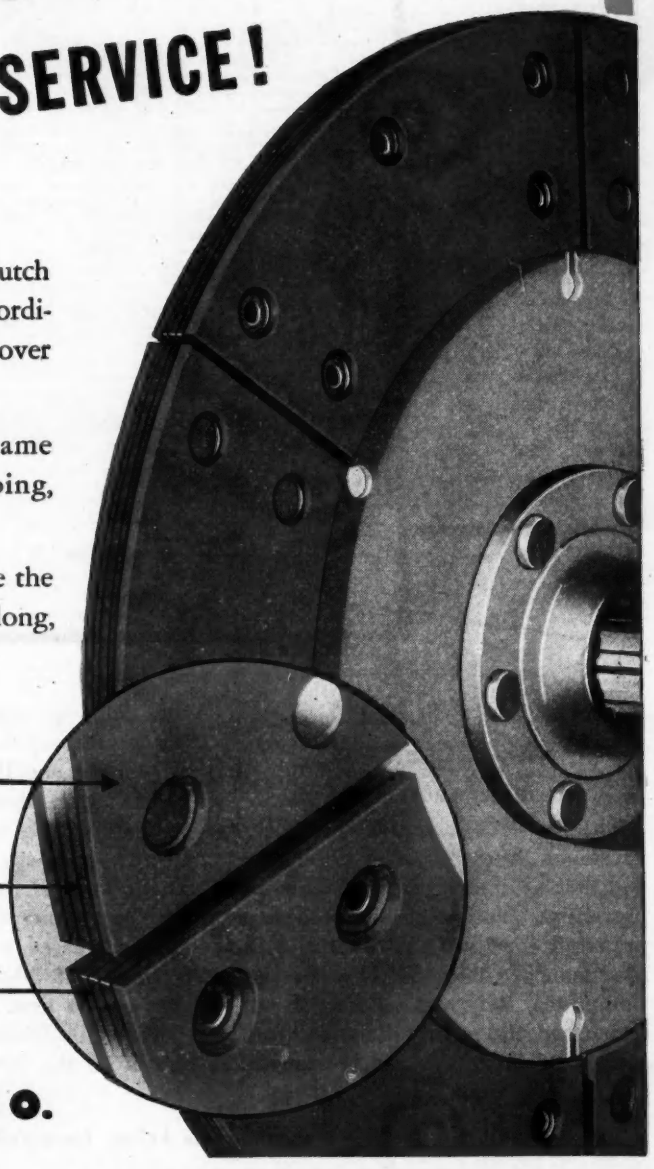
The acquisition of another new factory building is announced by Felt Products Mfg. Co., Chicago. The new building is a two-story structure containing 55,000 sq. ft.

HERE'S WHY VELVETOUCH ALL-METAL FACINGS WEAR LONGER IN ALL TYPES OF SERVICE!

Because of their *all-metal* construction, Velvetouch clutch facings and brake linings wear many times longer than ordinary friction materials. This has been proven over and over again—especially in heavy-duty truck and bus service.

Velvetouch is smooth in operation . . . as the name implies. It eliminates the principal causes of slipping, chattering and grabbing.

Use Velvetouch on your next clutch or brake job. See the difference it makes in smoothness of action and in long, trouble-free mileage!



Velvetouch is a scientific combination of powdered metals, engineered to give exactly the right friction qualities for each type of installation. It is little affected by oil, water or high temperatures.

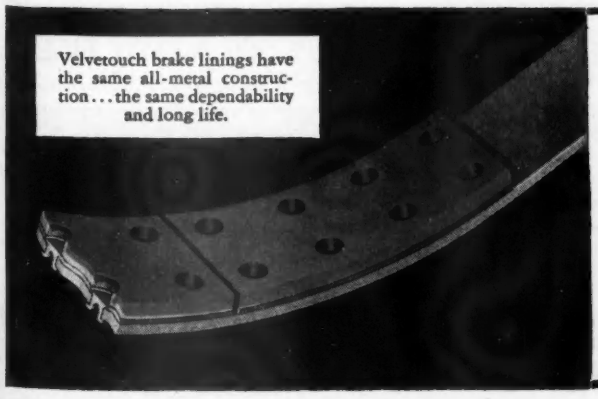
For maximum strength and high heat conductivity, Velvetouch is welded to solid steel backing plates.

Backing plates are riveted to the carrier plate. Heat is quickly carried away from the friction surfaces.

For complete details write to:

THE S. K. WELLMAN CO.

1374 EAST 51st ST. • CLEVELAND 3, OHIO

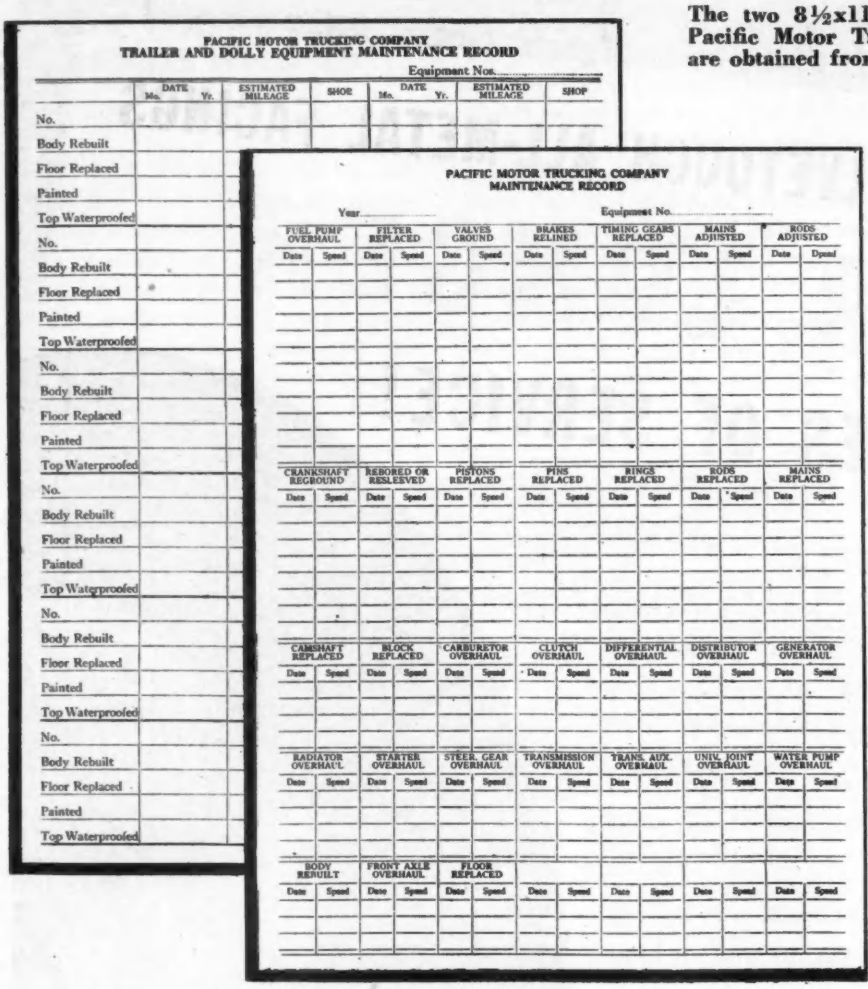


Velvetouch brake linings have the same all-metal construction . . . the same dependability and long life.

FOR BRAKE AND CLUTCH

USE Velvetouch

BIMETALLIC FRICTION MATERIAL—TRADE MARK REGISTERED



PACIFIC MOTOR TRUCKING COMPANY
TRAILER AND DOLLY EQUIPMENT MAINTENANCE RECORD
Equipment Nos.........

	DATE Mo. Yr.	ESTIMATED MILEAGE	SHOP	DATE Mo. Yr.	ESTIMATED MILEAGE	SHOP
No.						
Body Rebuilt						
Floor Replaced						
Painted						
Top Waterproofed						
No.						
Body Rebuilt						
Floor Replaced						
Painted						
Top Waterproofed						
No.						
Body Rebuilt						
Floor Replaced						
Painted						
Top Waterproofed						
No.						
Body Rebuilt						
Floor Replaced						
Painted						
Top Waterproofed						
No.						
Body Rebuilt						
Floor Replaced						
Painted						
Top Waterproofed						
No.						
Body Rebuilt						
Floor Replaced						
Painted						
Top Waterproofed						

PACIFIC MOTOR TRUCKING COMPANY
MAINTENANCE RECORD
Year......... Equipment No.........

FUEL PUMP OVERHAUL		FILTER REPLACED		VALVES GROUND		BRAKES RELINED		TIMING GEARS REPLACED		MAINS ADJUSTED		RODS ADJUSTED	
Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed

CRANKSHAFT REGROUND		REBORED OR RESLEEVED		PISTONS REPLACED		PINS REPLACED		RINGS REPLACED		RODS REPLACED		MAINS REPLACED	
Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed

CAMSHAFT REPLACED		BLOCK REPLACED		CARBURETOR OVERHAUL		CLUTCH OVERHAUL		DIFFERENTIAL OVERHAUL		DISTRIBUTOR OVERHAUL		GENERATOR OVERHAUL	
Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed

RADIATOR OVERHAUL		STARTER OVERHAUL		STEER. GEAR OVERHAUL		TRANSMISSION OVERHAUL		TRANS. AUX. OVERHAUL		UNIV. JOINT OVERHAUL		WATER PUMP OVERHAUL	
Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed

BODY REBUILT		FRONT AXLE OVERHAUL		FLOOR REPLACED									
Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed	Date	Speed

The two 8½x11-in. forms illustrated at left are part of Pacific Motor Truck's maintenance control system. Data are obtained from office copies of the inspection forms and maintenance records

P.M.T. FLEET'S PM PROGRAM

(CONTINUED FROM PAGE 66)

The inspections, which have been developed from our own experience and that of others, closely follow the preventive maintenance procedure prepared for the ODT by the SAE Maintenance Methods Coordinating Committee last year. Each of our seven inspections is outlined in detail on a form on which also is recorded the date, speedometer reading, and the number of the vehicle.

The first, or 1000 mile, inspection covers such items as the battery, brakes, cooling system, fuel system, steering gear, etc., as shown in Fig. 1. The vehicle is road tested, and general condition noted. Every vehicle also is greased at this 1000-mile interval or at 30-day periods, whichever occurs first.

The 2000-mile inspection, also shown on the form in Fig. 1, is not merely a duplication of the 1000-mile procedure. It includes checks and services found by experience to be most effective for safety and efficient performance at this period.

The same thought is back of the 5000, 10,000, 15,000 and the 20,000-mile inspections shown in Fig. 2.

The three high mileage inspections usually discover the need for major work, such as a rebore, main bearing job, transmission or rear overhauls. Thus, at the 25,000-mile period main and con-rod bearings are examined and adjusted, cylinders are miked, piston rings inspected, etc. All necessary repairs and replacements are made. While not shown on the form, in Fig. 3, valves also are ground at the 25,000-mile period.

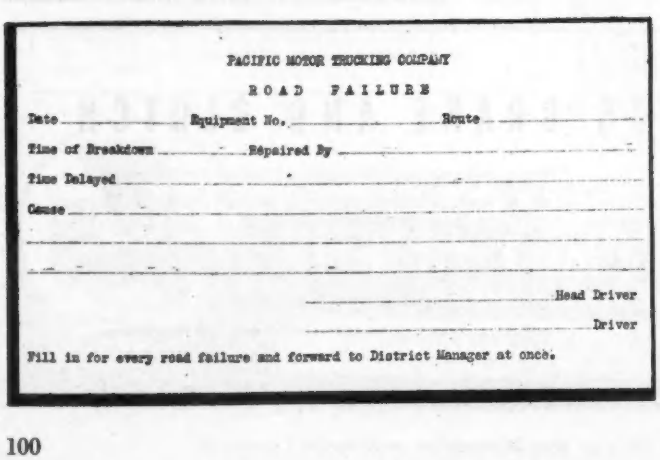
Major overhauls usually start at the 50,000-mile period. At that time only certain units are overhauled and the balance, such as the differential and transmission, are handled at the 100,000-mile period.

These procedures are modified in some respects for diesel-powered vehicles, and we have a series of inspections also for our trailers, semi-trailers and dollies, as shown in Fig. 4.

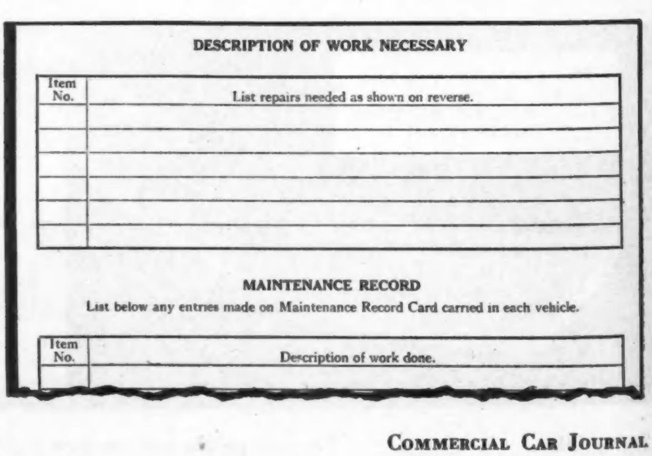
From the foregoing, it will be apparent that there is at least one scheduled inspection every 1000 miles. The first time, of course, is for the 1000-mile service. On the next, the truck is given the inspection for both the 1000 and 2000-mile intervals. On the third it is given inspection No. 1; on the fourth, Nos. 1 and 2; on the fifth, Nos. 1 and 5; on the sixth, Nos. 1 and 2; seventh, No. 1;

(TURN TO PAGE 102, PLEASE)

Record of every road failure is made on the 4x7-in. form at left. Right: Reverse side of Figs. 1 to 4, inclusive, and Fig. 6



PACIFIC MOTOR TRUCKING COMPANY
ROAD FAILURE
Date .... Equipment No. .... Route ....
Time of Breakdown .... Repaired By ....
Time Delayed ....
Cause ....
.... Head Driver
.... Driver
Fill in for every road failure and forward to District Manager at once.



DESCRIPTION OF WORK NECESSARY

Item No.	List repairs needed as shown on reverse.

MAINTENANCE RECORD
List below any entries made on Maintenance Record Card carried in each vehicle.

Item No.	Description of work done.

P.M.T. FLEET'S PM PROGRAM

(CONTINUED FROM PAGE 100)

eighth, Nos. 1 and 2; ninth, No. 1: tenth, Nos. 1, 2, 5 and 10. The 25,000, 50,000 and 100,000-mile inspections are combined at the proper mileage interval with the lower mileage inspections which may them be due.

These inspections bring to light repair work which needs to be done, which work, if let go, would result in a road failure or extensive damage to the engine or other parts.

We have experimented with lengthening the mileage interval on certain of the items and have run into trouble. We have a severe mountain operation in Eastern California, at elevations of 4000 to 9000 feet above sea level, where we handle 20-ton loads on steep grades in freezing weather in the winter and in extreme heat in the summer. Here it has been necessary, because of the severe operating conditions and because considerable mileage is run in the lower gears, to advance certain inspections, particularly rear end, to prevent road failures.

PM Control

All this inspection work and the repairs done at the time of inspections, or at other times, would get out of hand and hopelessly confused if we didn't have an airtight system of keeping track of both inspections and repairs. This is done by a card carried in each vehicle (in some cases it is held at the base point repair shop), and by a central office control, located at San Francisco. On one side of the vehicle card, Fig. 5, the inspections made are listed, and on the other side, Fig. 5A, space is provided for a record of 37 major repair jobs. The speedometer reading at which both the inspections and the repairs are made is shown.

This record of inspections is watched by our field supervisors, who can tell by comparing the speedometer reading on the truck with mileage of the last inspection on the card when the next inspection is due. If a vehicle is transferred from one base point to another, the card goes with it for guidance of our people and the shop at the new location. The record of major work on the other side is a guide to what work is likely to be necessary, and is a tip-off that the truck has been abused or that the previous job was improperly done if identical repairs are found necessary at too low a mileage interval.

We have similar cards for our trailers and dollies, Fig. 6, which tie in with the preventive maintenance program for this type of unit.

We also get in our central office a copy of the inspection form which is sent us by the shop when the inspection is done, and we tabulate these in a central control record for each vehicle which is used to check on the progress of inspection work. When an inspection is overlooked in the field, we find out why. A repair record similar to that carried in the vehicle is also maintained in the office so that we can check on repairs reported necessary from the field and investigate premature jobs at once.

Our inspections, up to and including the 10,000-mile job, are automatically .done without getting my ap-

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P.M.T. FLEET'S PM PROGRAM

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proval. Because the 25,000-mile jobs and higher may sometimes develop extensive repair work, I want to know when they are coming due and authorize the work. To control this, the man directly in charge of the truck requests authority for the work, and reports any heavy work found necessary. In some cases, the inspection is deferred a few days until a field trip is made by myself or one of our mechanical force to supervise the inspection and repair work. Especially is this done if repair work is claimed to be necessary which appears to be premature so we can find out what caused the trouble.

Fuel and Oil Savings Due to PM

The first year after this preventive maintenance program was fully in effect our miles per gallon of fuel on gasoline-powered trucks increased 3½ per cent, and our miles per quart of oil increased 22 per cent. These improved consumptions have either still further improved each year since or held practically constant, even though the average age and average size of units in the fleet have increased from year to year. The improvement of 3½ per cent represents a saving of 36,000 gal. of fuel per year based on 1943 mileage. The 22 per cent increase in miles per quart of oil, besides representing a substantial saving in oil expense, also indicates better all round motor condition. Our combined repair and inspection cost per mile is in line with the costs of other operators in similar work.

We are particular about oil consumption and condition. The crankcase oil level in our trucks is checked daily. Virtually all of our trucks are equipped with oil filters, but we change the oil in the crankcases the same in all of them, every 3000 miles. In the diesel engines we change oil at 2000 miles.

Generally, we use the same viscosity of oil in our trucks summer and winter—SAE 20 or 30, except where there is extreme summer heat or winter cold. We do not flush the crankcases of our gasoline trucks before refilling, but we do with the diesel engines, using a flushing oil.

We reclaim the crankcase oil drainages in our trucks, but we do not have our own reclaimer. About 30 per cent of the drained oil is reclaimed. The balance is lost that is, we don't collect it. We only collect drained oil from garages where there are from six to 10 trucks or more. Since the quantity available from the other places is too small and too far between stops to collect profitably, their drainage is discarded.

It costs us from nine to 10 cents per gallon to reclaim our drained oil. This oil is used only in the oldest vehicles or in engines burning oil

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Parts Service Operating

IN PEACE AND WAR...

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You can depend upon your JOBBER!

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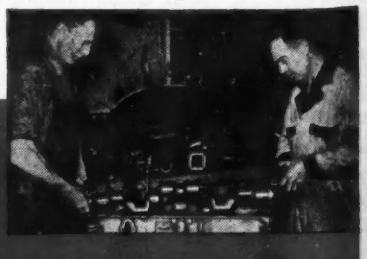

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to Fit Your Needs

...AND POSTWAR!

of new tools and service methods.

You and your Jobber are a successful team. Working together you have made it possible for the nation's fleets to keep rolling. In postwar your Jobber will still be right there beside you, helping you meet changing operating conditions, to adapt and improve maintenance methods as required.

Your Other Employee

. . . He is an active worker in your maintenance shop. His parts stock and shop facilities function as a part of your department. He helps find new ways for you to operate more efficiently. He protects values and quality standards of parts and equipment. His experience and knowledge will help you through the many changes of postwar adjustment. He is your Jobber.

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P.M.T. FLEET'S PM PROGRAM

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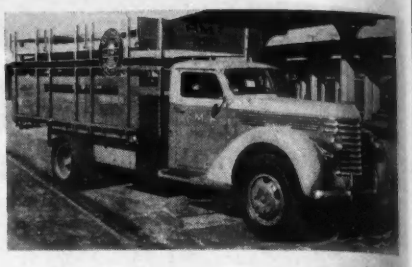
excessively but which we can get many more miles before overhauling. All engines using this oil are identified with a metal tag. When such engines are overhauled, we resume using new oil.

For our record of fuel and oil consumption, we use a card for each unit termed, Monthly Gasoline and Oil Record, a portion of which is illustrated in Fig. 7. We use the average miles per quart as a yardstick to motor condition. If consumption falls below what we think is proper for the type of motor and service it is in, we check to see what is wrong.

To help achieve temperature control, we have a manually operated type of shutter or curtain. We ask drivers to watch the temperature gage, and to hold engine temperatures between 160 and 180 deg. We also use thermostat, but not radiator covers.



We average about 25,000 miles for our original tires on the drive wheels of our trucks and from 30,000 to 35,000 miles on the front wheels. On our trailers and semi-trailers we get from 45,000 to 60,000 miles, and on recaps about 60 per cent of those figures.

Average Four Recaps

We have been recapping our tires since 1934. We average four recaps and we have had as many as eight. We find that properly done recaps are thoroughly safe and dependable, but we try to keep them off the front wheels of power units as far as possible in case there may be a hidden defect. On trailers, we use them on front wheels.

We match up dual tires every 5000 miles. We check the tire's outside diameter, and we match them accordingly. Sometimes we have to use a spare tire to achieve proper matching. Though we check every 5000 miles, we usually don't have to switch until the mileage is about 15,000, depending on the type of service the tire is in.

Our drivers (or service men at the larger points) are instructed to check tire pressure daily. We don't have them keep a daily record, but our field men check pressures when they inspect the equipment and find out what is the matter if a tire is below recommended pressure.

The assistant manager of equipment is constantly on the road—sometimes I am with him—and checks every piece of equipment, including tires as to wear and injury. He sees that inspection or repair work is being properly done and helps the service garages in their maintenance problems. Our preventive maintenance program wouldn't work properly if we did not have this regular field check-up, because there are always maintenance problems

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P.M.T. FLEET'S PM PROGRAM

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which the drivers and garages save up until he gets around.

Broad Salvage Program

We always have salvaged everything which justified reclaiming such as crankshafts, pump shafts, pistons, king bolts, clutch shafts, axle shafts, camshafts and brake drums, transmission and rear end housings. The crankshafts, camshafts, pump shafts, clutch shafts and king bolts are built up and reground. Engine blocks, differential cases and transmission cases are welded by specialists in this work.

We find that the cost of salvaging averages 50 per cent of the original cost on the large items and about 25 per cent on the small ones. A cylinder head which costs about $100 new can be reclaimed for about $50, if there are several cracks, or perhaps as low as $10, if there is only one crack an inch or so long.

These salvaged parts do not stand up as well as the original ones. There are certain salvaged parts that are as strong as the originals, sometimes even stronger, but there are other parts that are never as strong. A welded head or cylinder block, for example, won't stand up like the original, and it takes an expert to do the job. Even then, of course, a welder always will experiment and do anything along that line that is requested of him, as long as he is paid for the job, but that doesn't prove that it will be as good as new.

Nevertheless, the big saving makes it a matter of economy to use salvaged parts. Then, too, since now we can't get, in most cases, the original parts, we salvage often where we would not in normal times.

In our own shops the superintendent or foreman determines, partly from the original cost and partly from an estimate of the cost of repairs, whether a part shall be salvaged or not. The type of service the truck is in is also considered, particularly in the case of welded parts such as cylinder heads. If it is used in light service, we salvage without question. In in heavy-duty service, we replace with a new part—if we can get it—and hold the reclaimed part for future use in light-duty work.

We think proper driver training is closely allied with maintenance economy including fuel, oil, tire and repair costs. We have a manual for drivers which consists of a complete set of rules covering operating and maintenance matters, and ICC and state requirements.

Ordinarily, we allow our vehicles to equal the speed permitted by the state. Now, we have special instructions out to observe the ODT speed limit as a maximum. However, I think slower speeds cause increased maintenance costs, especially ring sticking, valve trouble and a shorter life for con-rod bearings. When the slow speed regulations first came out, we issued a warning to drivers not to lug the motors.

We have a safety director who conducts safety meetings throughout the system and who works in proper driving practices with safety. Usually, the men are addressed in small groups and are shown motion pictures along safety lines. We are start-

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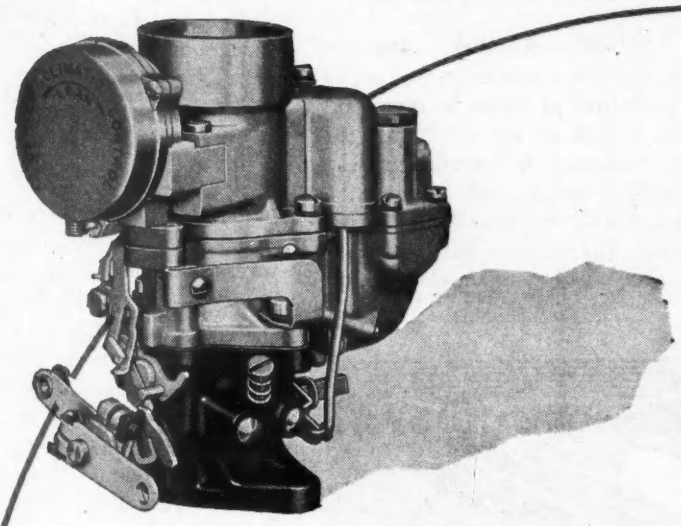

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(CONTINUED FROM PAGE 110)

ing to make our own safety pictures, which will show safe driving practices with our own men and equipment in the films. The stimulation of driver interest in safe and proper driving through our safety program, coupled with our preventive maintenance program, we think gets at the control of vehicle operating costs from both the operating and maintenance angle.

END

(Please resume your reading on P. 69)

WHAT MECHANICS WANT IN POST-WAR TRUCKS

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OIL PUMP — Another situation which could be easily corrected is the length of time it takes in many instances to get at the oil pump for simple repairs. On certain models, to remove, repair and replace the pump takes as much as 8 hrs. This condition is recognized by some manufacturers who have provided for removing fuel pumps and screens through an opening in the bottom of the crankcase. This opening should be so designed as to allow complete drainage of flushing liquid and foreign matter.

HEAD GASKETS — Cylinder head gaskets with enclosed outer edges should be done away with. The heads cannot be pulled down evenly enough to prevent water leaks with this type of gasket. Some manufacturers are going back to the old style open-edge type. If the other manufacturers had to service the engines, they would soon do likewise.

Speaking of gaskets, some engines do not have enough space or flange area left between each cylinder to get the full value of a cylinder head gasket. This space is so narrow that when the cylinder head is tightened, it squeezes the gasket over a section of the piston, and it is at these spots where gasket failures occur most frequently. If the cylinders could be placed a little further apart, this objection would be removed and, in addition, better cooling between cylinders would result. It might be pointed out further that many cracked walls occur right here. Whatever manufacturing benefits are obtained from this crowding would seem to be more than offset by operating and service difficulties.

Too much service time is spent removing heads. Even a slight water leak in many instances causes adhesion between the head and the studs. The only way to get them apart is to use a hammer and a chisel, or a crowbar. The result is either an occasional cracked head or frequently damaged edges, which are quite likely to cause trouble when the engine is re-assembled. Is there some practical way of treating the metal to prevent this?

DRAIN PLUGS—The drain plugs on the cylinder blocks have been so hidden by other parts that it takes an experienced mechanic to find and remove them to drain the blocks. Many blocks have been ruined because drivers, when their engines have failed, were unable to find the plugs, or if they did find them were unable to remove them because they required a special stud wrench to do the job.

ONE-PIECE BLOCK—In the two-

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For half a century, The Cleveland Pneumatic Tool Company has devoted itself to serving many major industries.* Skilled technicians and experienced engineers within our organization have pioneered and perfected many products for each of these fields. Thus initiative and resourcefulness have enabled us to keep abreast of this country's remarkable industrial progress . . . We are commemorating our golden anniversary by continuing to put all our talents and energies in the fight to preserve the American way of life. We are proud to have grown with our nation for 50 years, and look forward to serving in the great future that lies ahead.

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WHAT MECHANICS WANT IN POST-WAR TRUCKS

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piece block and crankcase, it is difficult to keep the cylinder block gasket tight. Oil leaks out and is blown around under the hood. This creates a fire hazard and accessories are smeared with oil. A dirty engine results. Electric connections are fouled. Wiring is ruined. This condition adds to the amount, and detracts from the quality of maintenance.

The effort to prevent this condition through tightening the nuts may result in distortion of the crankcase, throwing bearings out of line. Drawing the nuts down is made more difficult by the location of studs and nuts, and by accessories hung on the outside. The trend is toward the one-piece block and crankcase, and these difficulties are cited simply for the purpose of emphasizing the desirability of continuing in that direction.

Some manufacturers have eliminated the block hold-down studs on the valve side of the block, and depend solely on the studs and nuts along one side and ends of the block to do all of the work. This construction is contrary to good engineering practice and causes added maintenance time. When some nuts get loose and other hold, the block flange breaks. This is a major repair.

ACCESSORIES — Manufacturers should adopt standard locations for needed accessories, eliminating interference with any other service work, in so far as possible. We list accessories in their order of frequency of attention as follows: Oil filter, distributor, fuel pump, air cleaner, carburetor, water pump. Of course, the automatic choke is in trouble very often; more often than the driver realizes, especially in warm weather. There is considerable room for improvement here.

IGNITION—Adoption of moisture-proof ignition is urged. The army has it in one form or another, and it would cut down road failures of commercial vehicles. The thought has been advanced that if some of the time spent on distributors should be directed toward perfection of the magneto to replace battery ignition, the result would be beneficial.

Distributors should be fitted into the crankcase by a spline. Final timing adjustment should be made at the octant selector. Present design allows the distributor assembly to move, and timing position is lost when the lock screw becomes loose. Adjustments could be made in much less time with the spline construction.

Distributor caps should be numbered to correspond with the cylinder to simplify re-wiring.

Generator bracket should be designed with a free hinge, so that adjustment of fan belt can be made with one adjusting screw.

CLUTCH—Multiple-disc clutch presents more of a maintenance problem than the single-plate clutch. However, the construction of the latter should provide for adjustment from the bottom of the housing. Certain types of bodies make it inconvenient to perform this operation through the floor boards. While it is true that clutch repair is eliminated through replacement practices with

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WHAT MECHANICS WANT IN POST-WAR TRUCKS

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multiple-disc type, their life is shorter than the single-plate and more mechanic's time is entailed through their use.

GAS TANKS—Standard gas tanks are made out of metal too light to stand the strain to which they are subjected. In many cases they are soldered together where they should be welded. Gas tanks are not always mounted in convenient places to remove, and this accounts for many lost hours of maintenance.

SPEEDOMETER—The speedometer drive assembly can hardly be considered to have been placed in a convenient location, especially on short wheelbase chassis and tractors. It often requires considerable attention. One of two corrective measures could be taken: Either re-locate it where it could be easily reached, or else build into it the life of a normal transmission so that it does not have to be attended to more often than the transmission. To service the speedometer drive assembly in many instances requires a day's work.

WHEEL BEARINGS—Rear wheel bearings should be constructed so that it is possible to remove them at least with a bearing puller. Many times under some of the present methods of construction, it is necessary to burn off bearings with an acetylene torch. This procedure subjects the axle housing to possible damage, and we are told of instances where mechanics have consumed as much as 8 hrs. in removing a frozen bearing.

DIFFERENTIALS AND TRANSMISSIONS—The differential and transmission assemblies should be designed with a flat surface on the bottom, so that they would rest evenly on a jack. Many accidents occur due to the assemblies slipping off the jack. Various methods are used in most shops to prevent such an occurrence, but at present it is really a dangerous job to remove the heavy housings, unless they are held by some means from above. This is a suggestion which we think has much merit, if for no other reason than because of the safety angle. It would be advantageous to have the transmission and differential housing built with removable plate of sufficient size to allow for inspection and thorough cleaning of assembly. This plate might serve as the jack rest.

If someone would construct a differential assembly so that it would be possible to remove broken axles without removing the whole assembly, it would be advantageous. Some also would like to see the differential pinion gear housing constructed with removable collars or bushings where bearings fit into the housing. It happens that bearings do become loose and revolve in the housing, thereby wearing out the housing and necessitating replacing the whole unit. It is understood that the cups are not supposed to move, but sometimes they do, either from the expansion and contraction of different metals or perhaps because of wear and vibration.

AIR BRAKES—Where air brakes are used, simplification would seem

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WHAT MECHANICS WANT IN POST-WAR TRUCKS

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possible. The present hook-up, especially on tractor-semi-trailer units, contains too many valves, gadgets and other working parts which collect dirt, clog up and get out of order. Too much service is required to keep a complete air brake assembly in proper operating condition, and this is one part of the maintenance work which cannot be slighted.

PARKING BRAKE—A habit of a large percentage of truck drivers, especially those in the delivery class, is to bring the truck to a final stop by the use of the parking brake. Manufacturers should recognize this fact and design brakes capable of withstanding such abuse. Many truck manufacturers do not provide an emergency brake that meets legal stopping standards, even when new, resulting in unnecessarily high maintenance costs throughout the life of the vehicle.

OIL GAGE—Too frequently engines burn out because of lack of oil. At present the oil gage located on the instrument panel only indirectly warns the driver of lack of oil and generally too late to save the engine. To be sure when there is no oil, there is no pressure, but the gage indicates pressure after the quantity of oil in the crankcase has been reduced below the safety point. Also, of course, present methods of measuring the quantity of crankcase oil are a constant source of criticism. Why an indicator intended to reveal such important information as the oil level should be so hard to get at and so difficult to read in many instances is a mystery.

It would seem that some adequate gage or tell-tale signal could be devised which would warn the driver when the level of oil reaches the danger point, and also by which the oil level would be readily and immediately discernible. Many a ruined bearing can attribute its shortened life to this deficiency.

SLUDGE—Sludge too often collects around the timing gears and finds its way into the crankcase. The cause appears to be cold air coming

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WHAT MECHANICS WANT IN POST-WAR TRUCKS

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through the radiator and blown by the fan on the timing gear case. This condition could be corrected, either by proper insulation or a change in location of the timing gears.

Sludge bothers all of us, and it is felt that if a practical method could be found to drive off condensation, gas, water, etc., without overheating the oil, an improvement in this condition would be apparent.

FRONT AXLE—On medium and heavy duty vehicles, the front axles are often too light. Our opinion is that the construction of the front axle and steering assembly has not kept pace with increased weights and speeds built into such vehicles. The front end of heavily-loaded, fast-moving vehicles sustains terrific road shocks. Front axles which will carry the load do not withstand these shocks satisfactorily. Kingpins and axles bend and twist. This fact has been increasingly apparent to operators as a result of the attention directed to tire wear during the present emergency. Not only does this condition result in excessive tire wear, but also in hard steering and frequent adjustments, caused by the whole steering mechanism and axle being thrown out of line.

Although not directly a maintenance problem, it has been suggested that consideration be given to the irreversible type steering gear, which has some merit, particularly from the safety standpoint. With this type, road shocks are not transferable to the steering wheel. Also, the front wheel may drop into a hole or slip off the side of the pavement without throwing a fast-moving vehicle into the ditch. While the chief objection seems to be failure of the wheels to return readily to center position, recent developments in booster attachments should largely overcome the disadvantage of this characteristic.

CABS—"Cabs of comfort and convenience" might well be adapted as the slogan for construction. All wooden parts should be eliminated from cabs, as they only last a couple of years and, when they start to break and rot out, the whole cab goes to pieces. To replace a rotted or broken wooden part of a cab runs into considerable money.

Some manufacturers are now making all steel cabs but, in an attempt to reduce weight and cost, the metal structural parts are too light to stand the strain and, as a result, the steel cab does not last any longer than the steel and wooden ones did. The floor boards are too light and wear through too rapidly.

In late models, the air brake application valve is mounted on the floor boards, which "give" each time a weight is applied to the valve, or even to any part of the board, thus loosening the air connection to this valve so that it requires constant attention.

The instrument panel should be mounted on a hinge so that it can be turned down, exposing all electrical connections to the view of a man sitting on the seat. At present, a man must practically stand on his head to see behind the panel. It is almost impossible to do good work

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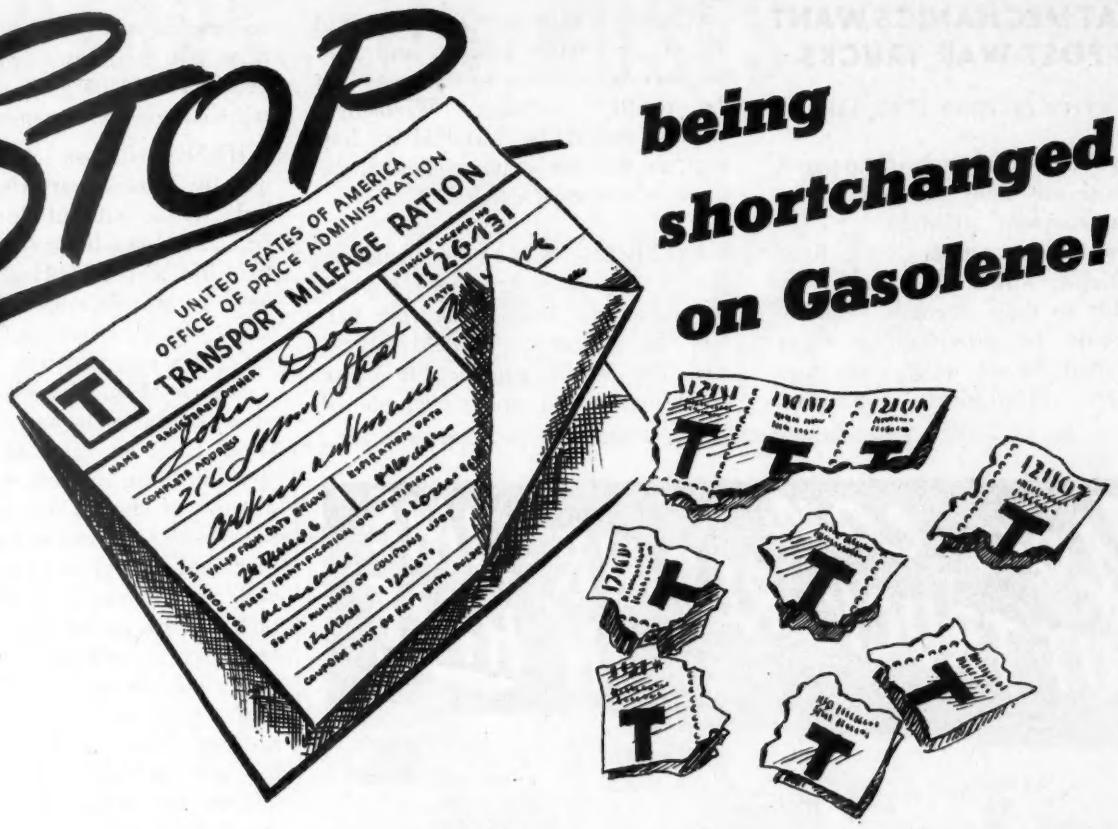

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YOU put *10* gallons of gasolene in the tank and probably get back only 8 gallons worth of mileage—the other 2 smoke out of the exhaust—unused—wasted! That's what's happening to more than half the vehicles in every fleet on the road . . . *yours may be included!*

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PERCENT OF VEHICLES CHECKED	PERCENT OF GASOLENE WASTED
65% showed waste of	15% or over
51% showed waste of	20% or over
44% showed waste of	25% or over
28% showed waste of	30% or over
17% showed waste of	35% or over
11% showed waste of	40% or over

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WHAT MECHANICS WANT IN POST-WAR TRUCKS

(CONTINUED FROM PAGE 118)

on anything on the back of the panel, and there are many things there requiring frequent attention.

Cabs can be made with fixed windshields, which would add considerably to their strength. Ventilation could be provided by other means that do not weaken the construction. Windshields and glass windows in cabs and bodies should be set in rubber gaskets, and held in place by molding so that they can be readily replaced. Windshield wipers should be installed at bottom, so that maximum vision can be given where most needed.

BATTERIES—Batteries must be placed in a more convenient place for servicing. The present truck battery is a heavy, unwieldy thing and, due to its tendency to cause corrosion, the present methods of suspension and position are not practical. On long runs, where there is considerable charging and discharging, batteries are inspected daily.

WHEELS—Chassis construction frequently locates rear wheels, particularly duals, without due regard for recognized conditions on which long tire life depend. Heat contributes most to unsatisfactory tire performance. In this region, chains also may be a source of tire trouble.

Wheels should be spaced to allow at least an inch and one-half between tires, and also allow sufficient space between tire and spring to permit use of chains. On some models, the wheels are so close to the springs that dual type chains cannot be used and, even before it is possible to attach a chain on the outside tire, it is secessary to pull the tire to get the side chain between the tires. Obviously, under such conditions chains are not always used when necessary for safe driving. Also, chains are left on the tires many miles more than necessary, with consequent harm to tires, as well as damage to the differential assembly or rear axle caused by excessive vibration.

Wheel studs and nuts cause continual trouble, both in small retail trucks and heavy-duty models. Studs break and nuts continually loosen. They are too small and too light. This fault occurs where the wheel is attached to the hub, as well as where the wheel is bolted to the axle flange.

BRAKES—All closed brakes should have a removable plate of sufficient size to allow for inspection and adjustment. The dust shield might even be attached in two parts, each of which can be readily removed.

GEAR SHIFT—The remote control type of gear shift in some makes has too many moving parts, all subjected to considerable wear, and no provision made for lubricating them or protecting them from dirt. In these makes, there are many connections between the hand lever and the transmission, and a small amount of wear in each joint adds up to enough lost motion to prevent gear shifting. The hook-up may be satisfactory for passenger cars, but it is not rugged enough for multi-stop delivery service.

FENDERS—No general discussion of maintenance is complete without

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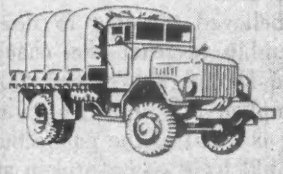
TRACTORS AND BUSES

king BY Bendix

. . . and here's why this basic new advancement in power braking is the biggest brake news in years!



Hydrovac—latest and greatest power braking development—is no longer a postwar promise. *It's available right now* to qualified wartime users. And that's great news because there's *nothing* like Hydrovac for simplicity, dependability, and sheer braking ability. If you own or service hauling equipment, study these pages—then see your Bendix dealer or write direct to Bendix Products Division, South Bend, Indiana. Don't trust war-vital carriers and loads to unsafe brakes. Get the best in power braking—Hydrovac by Bendix.

Proved Over Millions of Miles

Over roadless deserts and rough mountain trails, Hydrovac has served the armed forces since the war's start. *It's the best proved new product ever presented to the automotive field.*

Uniquely Simple in Design and Installation

The compact, completely-enclosed Hydrovac unit can be mounted *anywhere* on the vehicle and requires *only three simple tubing connections*—no mechanical levers or links.

Thoroughly Dependable and Free from Periodic Servicing

There's nothing to adjust on Hydrovac, either at installation or later in service; all working parts are enclosed and fully protected from dirt and water.

Designed, Engineered, Built and Backed by Bendix

Into this latest development has gone all the engineering and manufacturing skill that has long made Bendix the most trusted name in brakes and in vacuum power braking.

BENDIX AVIATION CORPORATION
20, INDIANA

WHAT MECHANICS WANT IN POST-WAR TRUCKS

(CONTINUED FROM PAGE 120)

mention of fenders. Trucks operated in the metropolitan districts, as well as those used on the farm, seem always in need of work on fenders. We advocate molded rubber or plastic to replace the thin metal stampings currently furnished. They should not only reduce maintenance cost but materially improve appearance.

ENGINE BASE—A large percentage of the service time is spent on engines. Because of this fact, we repeat a suggestion that is not new but we believe worthy of consideration, especially for certain types of chassis. Of course, every part of a truck can be removed and installed, but apparently sufficient thought has not been given to the length of time required to do this work as a maintenance operation, notwithstanding the fact that unnecessary maintenance time increases the cost per mile.

It may be that because of the rapid expansion in automotive transportation, operators have not yet been forced to direct enough attention to cost of maintenance in relation to the initial price. However, the operating cost more and more is becoming one of the determining factors in deciding on replacement equipment. Post-war competition within the automotive industry, and between the automobile and other forms of transportation, will focus attention on cost factors to a greater degree than ever before.

With this thought in mind, it is suggested that consideration be given to the construction of a sub base to carry a complete engine, clutch and radiator assembly. This sub base to be designed to match the base in the chassis, so that the whole assembly will slide into the chassis in one unit, which could be held in place with four bolts. Where the transmission is suspended from the clutch housing, the transmission should be removed, and also be installed with the above unit.

It is believed possible to design this assembly so that the change-over time should not exceed 2 hr. To accomplish this change-over, the following is a list of the connections which would have to be broken and re-made:

1—Battery cable.
1—Live wire to dash, for lights and ignition.
1—Wire from ignition switch to ignition.
1—Oil pressure line to gage.
1—Throttle control.
1—Gas line.
1—Connection to temperature gage.
1—Air line from compressor.
1—Clutch clevis pin.
1—Gear shift lever.
1—Spline to drive shaft.

Think of what it would mean in repair time and quality of workmanship to have these major assemblies as readily approachable to the service mechanics, as they were to the engineers who designed the chassis before it was assembled and before the body was installed.

Maintenance men in particular are interested in the reported simplification and standardization of army trucks. The hope is frequently expressed that post-war trucks will reflect this trend.

In order that commercial vehicles

(TURN TO PAGE 126, PLEASE)

Photo courtesy Allied Van Lines, Inc., Chicago

A 100% Pay Load is a truck full of products . . . AND TRUCK SPACE FULL OF ADVERTISING!

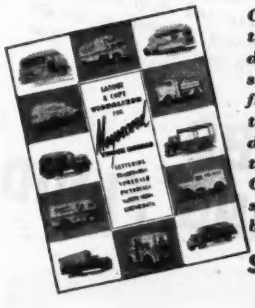
DECORATE YOUR TRUCKS WITH

MEYERCORD DECALS !

Empty trucks roll at a loss. So do "empty" or weather-worn truck panels. Decorate them with Meyercord Truck Decals . . . and deliver a 100% pay load of colorful sales impressions daily. Meyercord Decals are economical for a dozen trucks or a thousand. They are washable and weather-tested for durability. Any design, in any size or number of colors, can be reproduced . . . at a fraction of hand-painting costs. Fast, overnight application saves labor, money and idle truck time. Give your trucks that extra smartness of appearance and gain more advertising value on your "free" panel space . . . with Meyercord Truck Decals. Free design service. Address Department 32-6.

Buy War Bonds . . . and Keep Them!

Truck Visualizer — FREE!



Contains helpful hints on lettering, decorating; with outline diagrams for experimental designing of many body types — from panel deliveries to vans and tank trucks. Includes valuable data for maximum use of advertising space on all areas of trucks. Cash in on the free advertising space of your "traveling billboards."

Send for free copy TODAY!

THE MEYERCORD CO.

World's Largest Manufacturer of Decalcomania

5323 WEST LAKE STREET • CHICAGO (44) ILLINOIS

WHAT MECHANICS WANT IN POST-WAR TRUCKS

(CONTINUED FROM PAGE 124)

may fully benefit from any such improvements, the progressive manufacturer will acquaint himself with the reason for each item of maintenance expense. He should know the ratio of repair parts cost to labor cost, in terms of reasonable time needed for the service and repair, and he should concern himself with methods for reducing service time and effort. This can only be done by careful analysis of frequency of service and replacement needed for every part and accessory in relation to all others.

Also, a determination should be made of how each part can be serviced, repaired or removed with the least interference. Sizes of nuts, bolts and screws should be reduced to a minimum, and standardized throughout the industry, to save time and reduce the number and variety of tools needed. Every time a different size wrench or socket is needed, time is lost—frequently, far too much—because of scarcity of sizes in a shop or because the desired size has been mislaid. Unallocated time in every shop is a formidable item.

When parts are being designed, the question of maintenance cost should be considered equally with material cost and construction cost.

Utility and convenience of maintenance are sacrificed for appearance, particularly in smaller vehicles. This may be due to pressure from the operator, but the desire is often created by the truck manufacturers' publicity. There would be much less tendency in that direction if the buyer was thoroughly acquainted with consequent additional maintenance costs over the life of the vehicle.

It must be apparent that the problem here discussed is beyond the reach of the service mechanic. He simply services and repairs what the manufacturer produces. He uses the tools and, in general, the methods suggested by the manufacturer. However, the underlying causes responsible for unfavorable truck maintenance conditions also must be recognized before a universally satisfactory vehicle will be produced.

The inventive capacity of the men who have created America's trucks is easily capable of solving the relatively simple maintenance problems, but the important question is whether the industry can overcome national tendencies and characteristics sufficiently to accomplish the desired result.

Among these powerful American tendencies, which must be neutralized in order to produce the post-war truck that is ideal from the maintenance standpoint, are wastefulness and extravagance caused by the constant desire for something new.

The new idea of today often is surpassed in six months, and this calls for the utmost in production speed, in order to cash in on the improvement. Little opportunity is afforded, therefore, to consider the problems of maintenance, while, at the same time, the usual incentive to do so is removed. There can be no reason for becoming concerned over the reactions of the maintenance man under such conditions, because, by the time those reactions reach

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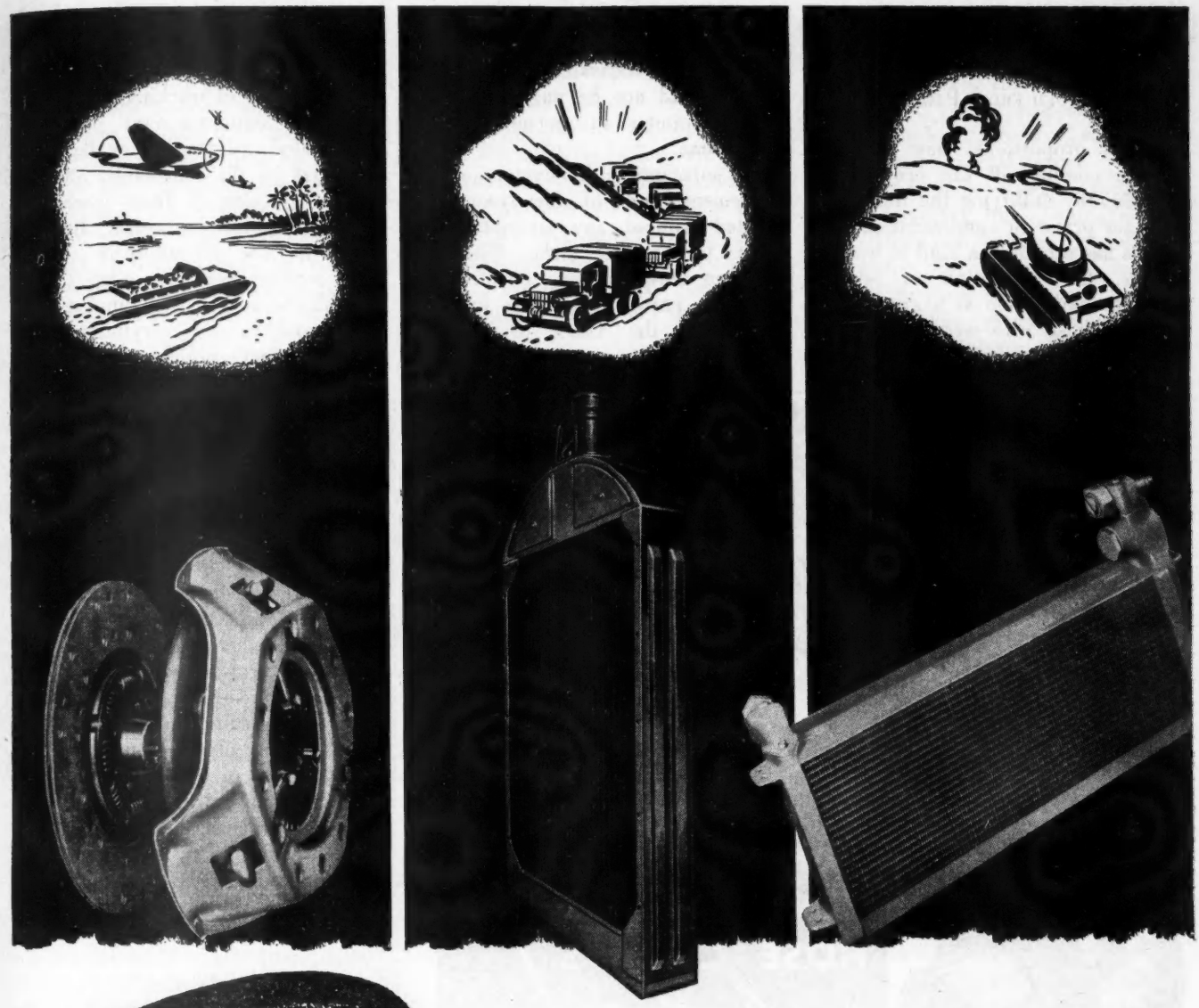

Dependability

Dependability is the keystone of Long clutches, radiators, and oil coolers—and that same dependability that is serving our fighting men on all fronts, in planes, tanks, trucks, and boats, will be available after the war in peacetime vehicles.

LONG MANUFACTURING DIVISION
BORG-WARNER CORPORATION

ARMY E NAVY

DETROIT 12, MICHIGAN
WINDSOR, ONTARIO

LONG
CLUTCHES AND RADIATORS

WHAT MECHANICS WANT IN POST-WAR TRUCKS

(CONTINUED FROM PAGE 126)

effective proportions, new models will be coming off the production line, thereby nullifying the influence of either praise or condemnation.

This has produced a kind of wastefulness, the realization of which seems to have come as a great surprise to those who were given the responsibility for wartime transportation. We were told, two years ago, that unless the most extravagant conservation measures were taken, there would not be any trucks left in the country in an unbelievably short time.

To substantiate this contention, replacement figures of other years were quoted without any attempt being made to interpret them. While no one can deny that governmental regulations, particularly those promulgated by the Office of Defense Transportation, are responsible, in no small degree, for the relatively satisfactory truck performance to date, few apparently realized that the economy of trucking, as directed by the manufacturers, practically compelled operators to replace used vehicles by the thousands, although but a fraction of their mechanical lives had been expended. In addition, no one in authority credited the maintenance men with the ingenuity to keep trucks running when they couldn't buy everything needed at a moment's notice.

I wonder if the extent to which maintenance men in the United States have taken the play completely away from the manufacturers is generally appreciated today. I hope, when normalcy once more returns, that these men who have kept the trucks rolling, often in spite of suppliers rather than with their help, will get at least a measure of the credit due them for their contribution to the war effort. It is this combination of government regulation and maintenance accomplishment that daily demonstrates past wastefulness of truck operating life.

And as to extravagance, nowhere in the world, except in the United States, could utility in a strictly utilitarian vehicle be so completely sacrificed, or subordinated to appearance and individual artistic whim, with such little regard for maintenance difficulties or cost.

Thoughtful consideration of the question of trucks "post-war maintenance-wise" therefore points to the inescapable conclusion that the correction of maintenance difficulties, and the reduction in service and repair costs, is not to be attained through a citation of the several remedial suggestions concerning specific characteristics or deficiencies of present construction and location, but can only be properly accomplished when the truck is designed.

During the pre-war motor truck expansion era, the emphasis was on operating performance to meet constantly changing conditions in new fields of operation. The post-war trucks, in addition to performance, must have maintenance economy built into them if they are to survive competition. The manufacturer is the one best qualified to incorporate into his truck such improvements as will produce the greatest economy of maintenance time and

(TURN TO PAGE 131, PLEASE)

(CONTINUED FROM PAGE 128)

effort, and he should determine the changes which will accomplish this result through his own research. If he will give maintenance cost equal consideration with operating performance when designing the vehicle of the future, very definite improvements in accessibility, simplification and standardization will be made, and the result will be satisfactory to maintenance mechanics.

END

(Please resume your reading on P. 41)

Three Models IHC Now on Line for Essential Civilian Use

International Harvester reports continued production of commercial trucks for 1944, as authorized under governmental order to meet essential civilian requirements. While manufacture of the heavy-duty Model KR-11 began about Jan. 1, the company recently started producing units in the medium and light-heavy classes.

Now being produced in limited quantities are the medium-duty Model K-5, and the heavy-duty Models K-7 and KR-11, 13,500, 16,500 and 27,000 lb. g.v.w., respectively. All three models are available with 2-speed rear axles if desired.

"Several improvements, including more powerful Blue Diamond and Red Diamond engines in Models K-7 and KR-11, respectively, are embodied in these new trucks," stated P. V. Moulder, general manager of the Truck Division. "The K-7 is equipped with hydraulic brakes with the newly developed hydrovac vacuum-power system, while the larger model has air-brakes. Some of the changes in these basic pre-war models has been contemplated before truck production was stopped by the government in March, 1942. Most of them have been incorporated in various military models produced since that time and, under material regulations, it was permissible to make use of them in new civilian production."

These new civilian trucks will be sold through the regular International Harvester branch and dealer organization to operators whose business requirements place them in the ODT priority list.

Riso and Roper Join Great American Industries

Ovid Riso has been appointed advertising director of Great American Industries, Inc., with headquarters at 247 Park Ave., New York. Mr. Riso will be responsible for the advertising and public relations of all divisions of the company, including the Connecticut Telephone and Electric Division, Meriden, Conn., Ward La France Truck Division, Elmira, N. Y., Virginia Rubatex Division, Bedford, Va., and Rutland Electric Products Division, Rutland, Vermont.

Mr. Riso was formerly advertising and sales promotion manager of the International Division of the Radio Corp. of America and more recently was connected with Young & Rubicam, Inc., New York advertising agency.

Langdon H. Roper has joined Great American Industries as assistant to the president, H. W. Harwell. Mr. Roper was president of the Ingersoll-Waterbury Co. and for many years was vice-president and director of export sales of Valentine & Co.

WARTIME COSTS OF FLEET OPERATION

(CONTINUED FROM PAGE 47)

From the same type of analysis of a group of passenger cars we found that our maintenance and depreciation cost at 40,000 miles was 1.8 cents whereas at 70,000 miles it has increased to 1.89 cents, or .09 cent. The .09 cent for 70,000 miles amounts to $63.

Assuming 40,000 miles as the most economical trade-in point, we have run 30,000 miles beyond that point at an increased cost of $63 or .21 cent per mile. Adding .21 cent per mile to our most economical cost of 1.8 cents per mile is an increase of approximately 12 per cent. These cars were about 3 years old at their most economical trade-in point and are now slightly over 5 years old.

From these figures we can draw the conclusion that the previous practice, as to the most economical trade-in point, was approximately correct, and they give us an approximate figure of how much maintenance costs have been increased in running vehicles to this extended period of time and miles. The 12.5 per cent and 12 figures developed in this study are not offered as yardstick figures, because a difference in type of operation or a variance in maintenance standards could change them materially. To us, they show that our maintenance costs for extended life have, so far, not increased by an unreasonable amount. However, since the war seems to be a long way from being over, the trend of these curves would indicate that this figure will continue to increase with increased age and mileage.

In taking the first point at which the lowest maintenance and depreciation cost per mile is reached, I have not included the increment of cost arising from the greater investment in equipment when replaced at an earlier age.

In the case of the half-tons cited above, replacement at the 70,000 mile point would result in an average fleet condition of 80 per cent whereas replacement at the 120,000 mile point would represent an average fleet condition of 65 per cent. This is based on 40 and 70 per cent depreciation for the respective points. For vehicles costing around $892 an average condition of 80 per cent requires 15 per cent greater investment than a fleet which averages 65 per cent condition. This amounts to $134 which at 5 per cent interest costs $6.70 per year.

I am sure any of you, who have had experience with drivers and their care of new appearing equipment versus somewhat older equipment, will agree that it would not be difficult to recover this $6.70 per year if you were able to trade your vehicles at slightly over 2 years of age rather than 4 years of age or older.

One thing that can't be overlooked when you are able to review the detailed cost history of vehicles from their date of purchase is that there are many factors besides the first cost of a vehicle which should influence your choice of equipment. The record for the groups of high mileage half-tons referred to previously shows that gasoline has cost approximately twice what the vehicles cost, and that cumulative main-

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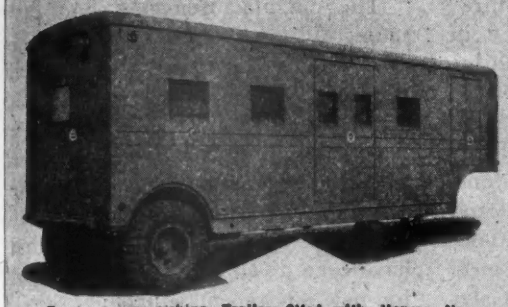
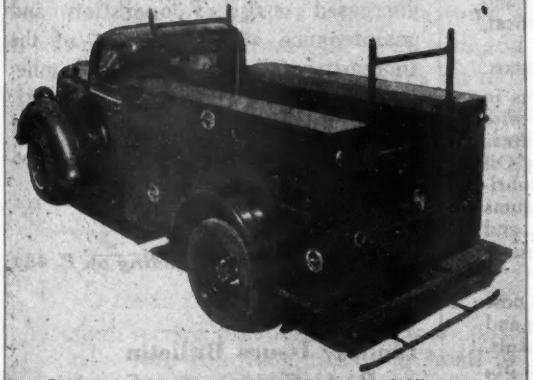


Fruehauf map-making Trailer fitted with Hansen No. 79-L Flush Handle which streamlines body and permits full-width use of interior.

Texaco 1250-gallon airplane refueling unit equipped with Hansen Locks and Flush Handles. Tanks of this type are used at various airports.

2000-gallon Texaco aircraft refueling tank truck. Uses Hansen Locks and space-saving Flush Handles. Tank filters and meters fuel. Gar-Wood-built.

2100-gallon combination gasoline and fuel oil tank. Hansen-equipped with Locks and Flush Handles. Delivers fuel to mechanized forces.



This truck, with its many compartments for holding repairs and replacements material, is fitted with Hansen Locks and Flush Handles. Built by McCabe-Powers.

HANSEN
HARDWARE for Commercial Bodies

The HANSEN HANDLE THAT HAS MADE HISTORY

Illustrated above—No. 79-L FLUSH HANDLE. Dimensions, 6 3/16" wide. Recess, 4½" wide, ½" deep. Shank, 3⅛" long, 5/16" dia. Flange, ¾". Wt. 1 lb., 2 ozs. Curved handle conforms to inside of cup. Fits flush with door.

NO Handle perhaps has achieved such distinction and widespread use as has the HANSEN FLUSH HANDLE used on the map-making trailer, refueling and other units illustrated. It permits effective use of every inch of space; streamlines units, making them trim, compact and more attractive. Result—more payload at less cost.

Fits flush with doors and body. Pulls out when in use—folds in when not in use. No projections to take up valuable load width, catch clothing or obstruct free movement of truck in limited space. Turns freely in a circular cup, giving full play to handle and hand without danger of bruising or barking knuckles. Applied to metal or wood doors. Made in wide and narrow-flange types, in widths up to 6 3/16". Used on tanks, trucks, trailers and cabs. On them all it has made history.

Besides Flush Handles, the Hansen Line includes—Locks (Slam-and-Take-up, Slamming, Rotary, Refrigerator, Sliding Door, Cab); Hinges (Leaf, Plain, Square- and Round-Corner); Window Regulators (Straight-Lift and Balanced types); also various types and sizes of one-hand Automatic Tackers for driving Hansen Tackpoints and T-head Tacks up to ½" length.

Request Catalog showing the complete line of Hansen Handles, Locks, Hinges, Regulators; also, one-hand Automatic Tackers, if you don't already have a copy.

A.L. HANSEN MFG. CO. 5047 RAVENSWOOD AVE. CHICAGO 40, ILL.

WARTIME COSTS OF FLEET OPERATION

(CONTINUED FROM PAGE 132)

tenance expense has also been double the cost of the vehicle. On this basis a 20 per cent increase in purchase price could be offset by either a 10 per cent reduction in maintenance or a 10 per cent reduction in gasoline consumption.

A problem that we see developing arises from the estimates being requested by the manufacturer as to probable immediate post-war requirements for replacement vehicles. It is going to require careful handling by the fleet operator to make replacement budgets and maintenance schedules agree. With no end of the war in sight, maintenance operations are now generally directed to keeping equipment in first-class condition. Some of the present-day maintenance expenditures on older equipment are so sizable that they will of necessity push the replacement date of the vehicle back considerably.

The manufacturer may find that many of the operators will not be crowding at the delivery line until they have had a chance to run out some of their vehicle condition, if new production is resumed without considerable advance warning. This may not displease them, but it can readily upset loose optimistic estimates that have been given as to what the need for new equipment will be.

The rubber conservation program has had quite an effect on our tire costs. The following figures illustrate this point:

Year	Miles	Number New Tires	Tire Costs	Cost Per Mile
1941	10,601,214	2,200	18,336	.17c
1942	8,714,826	351	17,684	.20c
1943	8,090,560	943	29,210	.36c

The fact that we bought 351 tires in 1942, and 943 in 1943, shows that we have been living off our so-called "tire fat." Of the 943 tires purchased in 1943, approximately one hundred were used casings for recapping. The extravagant economy of extensive repairs and present grade materials is shown by the doubling of the cost per mile since 1941.

Another figure that may be of interest shows the effect of 2 years of wartime operation on our total operating costs per mile. This cost has increased 25 per cent from 1941 to 1943. Since during this same period mileage has decreased approximately 24 per cent, I am unable to tell you exactly what part of the 25 per cent increase results from increased costs of operation and maintenance and what part of the increase results from reduced mileage. I would estimate that approximately 17 per cent is due to increased cost and 8 per cent due to reduced mileage.

END

(Please resume your reading on P. 48)

Lindsay Issues Bulletin on Body Engineering Service

Fleet operators who are contemplating the purchase of new equipment will be interested in the new Lindsay Structure truck body folder, which describes both the "packaged unit" truck body service and the Ls Fleet Engineering Service. Copies are available from local, authorized Lindsay Structure dealers or direct from Lindsay and Lindsay, 222 W. Adams St., Chicago 6, Ill.

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(CONTINUED FROM PAGE 50)

for maintenance purposes, three auxiliary legs with casters are bolted onto the engine sub-frame. Two legs are attached to the front corners of the sub-frame and the other is bolted to the center tube in the rear. Then 14 connections between the engine sub-frame and the rest of the vehicle have to be disconnected before the engine unit can be rolled out for servicing. The engine sub-frame with its three leg attachments serves as a convenient stand while any maintenance operations are performed. Two skilled mechanics can remove the engine unit and replace it with another engine unit in 30 to 45 minutes. In removing the engine unit from the cab, the emergency brake and clutch controls are unbolted, two vacuum brake lines are disconnected, the accelerator ball and socket joint is unsnapped, the gear shift lever is unscrewed, two wiring plugs, one for each engine, are pulled out, two vacuum lines for the dashboard oil check are disconnected, the three-way shutoff valve to the gasoline tanks is closed and the two gasoline lines unjoined, and two spline joints are slipped out of the drive lines. These lines are staggered slightly to make removal easier.

Oil "Eye" Shows Level

The tractors have a gasoline capacity of 300 gal., enabling them to cover 1000 miles without refueling. There is a 90-gal. tank on each side of the cab and an underseat tank holding 120 gal. Early in the operation some difficulty was encountered in burning out engines through failure to add oil on the road. The floorboards of the cab have to be removed to check the dipstick and to add any oil, so some of the less conscientious drivers ignored it. To simplify this procedure, an oil "eye" for each engine was installed on the dashboard. If a driver wishes to check the oil, he merely pushes a button and if the oil in the crankcase is sufficient, it feeds into the oil "eye" on the dash. If no oil appears, he knows it is down at least a quart. A light also illuminates the oil "eye" so the driver or mechanic can tell if the oil in the crankcase is clean or dirty. We also are working on an experimental development in which two 10 gal. oil tanks, one for each engine, are installed under each seat. If the oil "eye" reveals that the oil level is down, the driver turns the correct valve between the seats and one quart automatically flows into the crankcase. Then he presses the button on the dash to see if the full level has been reached. If no oil appears, he adds another quart from the under-seat tank and so on until the crankcase is full again.

Tandem Rear Axles

The rear of the tractor has a tandem axle arrangement, with dual wheels on each axle. The right engine drives the forward axle of the two rear axles and the left engine drives the second axle. Each has its own driveshaft. The rear axles were developed by engineers of Dearborn Dual Drive, Inc. They are 48 in. apart, with a trunnion bar between. Each axle is of the banjo-type with its own differential carrier. This will house any of the three standard Ford

(TURN TO PAGE 139, PLEASE)

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(CONTINUED FROM PAGE 136)

differential gear ratios. We use the intermediate gear ratio of 5.88 to 1. The plate on the housing can be easily removed to service the differential gears by taking out 10 bolts.

A ball and socket joint fits into a spring shackle near the end of each axle, the shackle having a steel babbitt lining and being sealed to carry adequate grease for lubrication. Heavy leaf springs are attached to this shackle and they in turn carry the frame. This ball and socket arrangement on the shackle permits ultimate flexibility of the axle. The right wheels can be raised 20 in. off the ground, with the left wheels remaining on the ground, and the frame still will remain parallel to the ground under this arrangement. Also, the right wheels of one axle can be raised at an angle to the ground and the left wheels of the other axle can be likewise raised, yet the frame will remain parallel to the ground. This axle and springing arrangement minimizes torsion on the frame. The standard springs are 48 in. long, with 14 leaves in the main spring and eight leaves in the helper spring. They have 10-ton capacity.

Each axle is individually steered by its own torque arm, automatically following the turning radius of the vehicle. This arrangement reduces tire scuffing to a minimum and makes for easier handling of the tractor unit on short turns. The front axle is of tubular design, with a 8500-lb. load capacity. Steel inserts provide attachments to the steering knuckles.

The tractor frame is of tapered design, measuring 54 in. at the front and 42 in. at the rear. It is 15 ft., 6 in. long and is made of high tensile alloy steel and all-welded construction.

The tractor has a gross vehicle weight of 12,400 lb. Two spare tires are carried behind the cab. Louvers on each side of the cab can be removed to work on the engines. The fifth wheel is set ¼ to ½ in. ahead of the rocker shaft.

As two drivers alternate in operating the vehicles, a bed is located in the cab back of the seats. The cab itself is 88 in. wide. The driver's seat is adjustable. An air scoop is attached above and behind the fan on each engine. This scoops up the fresh warm air coming from the radiator and carries it through flexible hosing to an adjustable vent located in the floorboard of the cab. One vent can be directed at each side of the cab. The vents are flexible so the direction of the air can be regulated and the amount of warm air adjusted. This assures plenty of warm fresh air in cold weather and maintains a slight but constant pressure in the cab, thus eliminating any foul air seeping up from the engines. There also is an adjustable ventilator in the cab roof and two airports in the cab front to insure enough fresh air in warm weather. A canvas winter front which can be raised or lowered to suit the convenience of the driver is located on the front grille of the cab. This raises the engine temperature to the necessary level during the winter.

The batteries formerly were located back of the engines but due to the heat built up there and the lack

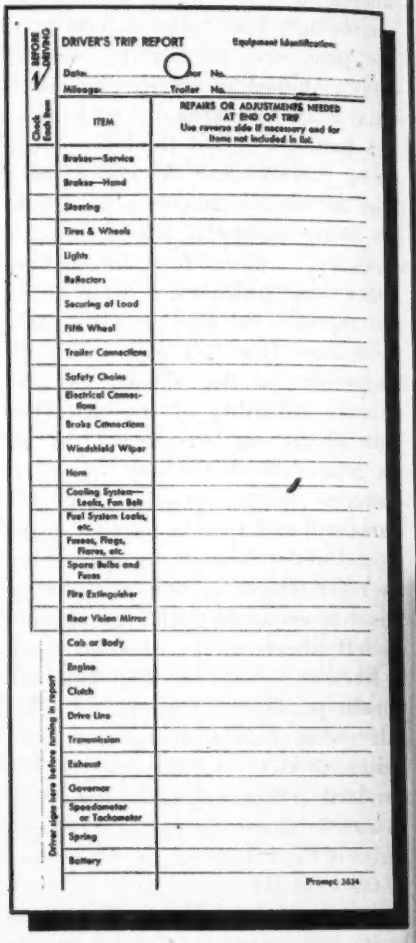
(TURN TO NEXT PAGE, PLEASE)

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(CONTINUED FROM PAGE 139)

of ventilation, they deteriorated rapidly and had to be replaced with great frequency. In order to remedy this condition, the batteries were moved in front of the radiators, where there was less heat and the fresh air coming through the front grille kept them cool. This also made the batteries more accessible for checking the specific gravity and the water level. These checks sometimes were neglected by the drivers when the batteries were behind the engine. Moving the batteries to the front ended the battery trouble.

Before we inaugurated this trucking operation to the Southwest in May, 1942, all bridges and viaducts along the route had to be checked to see if the overhead clearance was sufficient to permit passage of the 12 ft., 6 in. high trailers. We operate to Tulsa, 970 miles from Dearborn, on a 36-hour schedule and to Fort Worth, 1275 miles from Dearborn, on a 48-hour schedule. Two drivers are assigned to each tractor, each being at the wheel five hours, with a one-hour rest period between changeovers. Thus the tractor-trailer combinations are in operation 20 out of 24 hours on a trip, using the four one-hour rest periods for meals and the checking of necessary equipment. The off-duty driver makes use of the bed in the back of the cab.



DRIVER'S TRIP REPORT — Equipment Identification

Date ____ Car No. ____

Mileage ____ Trailer No. ____

Check Each Item	ITEM	REPAIRS OR ADJUSTMENTS NEEDED AT END OF TRIP. Use reverse side if necessary and for items not included in list.
	Brakes—Service	
	Brakes—Hand	
	Steering	
	Tires & Wheels	
	Lights	
	Reflectors	
	Securing of Load	
	Fifth Wheel	
	Trailer Connections	
	Safety Chains	
	Electrical Connections	
	Brake Connections	
	Windshield Wiper	
	Horn	
	Cooling System—Leaks, Fan Belt	
	Fuel System Leaks, etc.	
	Fuses, Flags, Flares, etc.	
	Spare Bulbs and Fuses	
	Fire Extinguisher	
	Rear Vision Mirror	
	Cab or Body	
	Engine	
	Clutch	
	Drive Line	
	Transmission	
	Exhaust	
	Governor	
	Speedometer or Tachometer	
	Spring	
	Battery	

Driver signs here before turning in report

Prompt 3634

This 4x9-in. form aids maintenance

We also operate occasionally to San Diego, which is 2600 miles from Willow Run, on a four-day schedule. Railroad freight shipments between the same points usually take 13 days. For one three-month period the San Diego trip was a regular part of our operation, with truck loads leaving daily for the West Coast.

Drivers are instructed to observe a 45 mph. speed limit, the extra 10 mph. being permitted because we are carrying urgent war freight. The schedules allow for a 30-mph. average speed. Drivers can use their own discretion in making their first stop at

(TURN TO PAGE 142, PLEASE)

Designed to STAND WEAR —

RIGHT WHERE THE WEAR COMES

NOTICE the toe and heel of your socks. Now, notice the construction of Titeflex oil and fuel lines. Both are re-inforced — and for exactly the same reason: to withstand long, hard wear, right where the greatest wear comes.

At the top of each convolution, Titeflex provides not one, but four thicknesses of metal. But that's not all — Titeflex is completely metal — not affected by gas, oil or liquids — not damaged by high temperatures. It's fully flexible — stands excessive amounts of vibration. It's inherently leakproof — even under high pressure. Titeflex lines are built to last. Even the outer braid is woven *onto* the tubing (not slipped on after it is made) to provide greater durability, greater strength.

On many a tank, jeep, truck or other vehicle in the war effort, Titeflex fuel lines are today demonstrating these superior qualities — and their resulting economy. If you operate heavy equipment essential to the war effort, Titeflex is available to you now. And on other equipment you may soon be able to provide these same features in your maintenance service — to assure low operating costs — and secure worth while profits. Let us give you the facts — without obligation, of course.

TITEFLEX, INC.
525 Frelinghuysen Avenue,
Newark 5, New Jersey

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(CONTINUED FROM PAGE 140)

Gibson City, Ill., 360 miles south from Dearborn, or at Villa Ridge, Mo., 600 miles from the starting point, depending upon weather conditions and the amount of gasoline or oil they are consuming. They take on 30 gal. of gasoline at one of those points and check the oil, water and tires.

The company maintains service garages at Lebanon, Mo., 750 miles from Dearborn, and at Fort Worth. Any repair work required in Tulsa or San Diego is done by a Ford dealer in those cities. The Lebanon stop also has a nine-room bunk house for the drivers. Three mechanics are on 24-hour duty at both Lebanon and Fort Worth to handle gasoline, lubrication, checking of batteries and tires and any repair work that may be necessary on the units.

In case of a breakdown on the road, drivers are authorized to call the nearest Ford dealer and have the necessary repairs made. Emergency road repairs average one a day, the most frequent calls being for ignition, carburetor and fuel pump adjustments. If trouble develops with one engine, the tractors usually can reach the nearest Ford service point on the other engine unless they are in the hilly country of Missouri. Tractors have come from St. Louis to Dearborn on a single engine after dropping the trailer. The idle engine is divorced from the dual setup by disconnecting the axle shaft and leaving that engine in neutral.

Tires used on both the tractor and trailer are 8.25 x 20 size. The tractor alone has 10 tires and the trailer eight tires on its two tandem axles, while two spares are carried back of the tractor cab. Tire pressure is checked twice by the drivers between Willow Run and Tulsa or Fort Worth. These checks are made during the rest stops at either Gibson City or Villa Ridge and at Lebanon. A tire pressure of 95 lb. is maintained in the tractor and trailer tires except in warm weather, when the inside duals are inflated to only 90 lb.

Front tractor tires average 50,000 miles before recapping but the recaps never are placed back on the front wheels due to the safety factor. Likewise, tires are removed from the front wheels when the tread begin to become smooth. Only one front tire has blown out since the operation started. Rear tractor tires average 38,000 to 40,000 miles before recapping. Tires may be recapped once or twice, depending upon the condition of the carcass. The first recaps generally average 35,000 to 40,000 miles, although some have run as high as 60,000 miles. Tires may be switched from the front to the rear wheels of the tractor after some wear but there is little switching between the tractor and trailed. An effort is made to match up the tires on all dual wheels, putting recaps together. Front wheel alignment is checked after each round trip as another safety factor.

Tire wear on the trailers is much more severe than on the tractors. The outside duals often whip off the road due to the extra width of the trailer units. Short turns in passing through

(TURN TO PAGE 144, PLEASE)

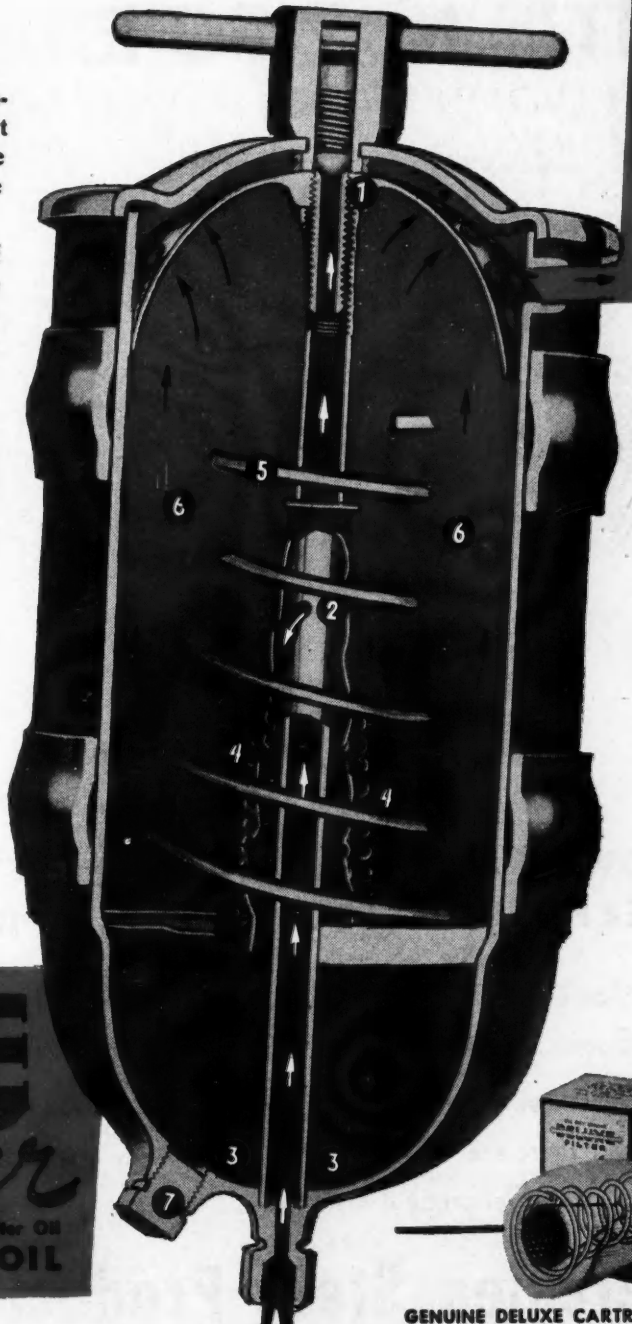
"Controlled Depth" DeLuxe Oil Cleansing Meets the Filtration Requirements of the New *Detergent Oils*

The new detergent oils, the Petroleum Industry's great development in the war against sludge, engine varnish, etc., do not eliminate the need for an oil filter.

They simply make necessary the use of an oil filter which has the capacity to remove much finer particles than heretofore has been required of the conventional type filters which strained out the sludge and other contaminants.

The new detergent oils re-emphasize the importance of the DeLuxe principles of oil cleansing. For regular oil, the Controlled Depth method employed in the DeLuxe Filter removes asphaltenes and other contaminants before they can form into sludge and other formations. For detergent oils, this method provides the Controlled Depth absorption essential to the removal of the minutest particles diffused by the additives without affecting the chemical balance of the oil.

Get ALL the FACTS about DeLuxe. Write for a free copy of "The Key to Clean Lubrication". Your copy will be sent to you without obligation. DeLuxe Products Corp., 1406 Lake Street, LaPorte, Indiana.



DELUXE
Oil Filter
Does More than Strain Oil . . . More than Filter Oil
ACTUALLY CLEANSES OIL

GENUINE DELUXE CARTRIDGES ARE AVAILABLE . . . ACCEPT NO SUBSTITUTES

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(CONTINUED FROM PAGE 142)

cities also are harder on the trailer tires. Wear on the right rear dual tire of the trailer is 10 times greater than on the other trailer tires. This tire picks up debris thrown by the dual tires in front of it. In Missouri the crowned highways have a rock gutter, which leaves this right rear dual in the air, where it occasionally hits a stone edge. The load distribution in the trailer also is not always helpful to long tire life. The maximum load is 27,000 lb. for a load of boxed airframe spare parts but this may not be equitably distributed, causing overloading of some tires on the trailer.

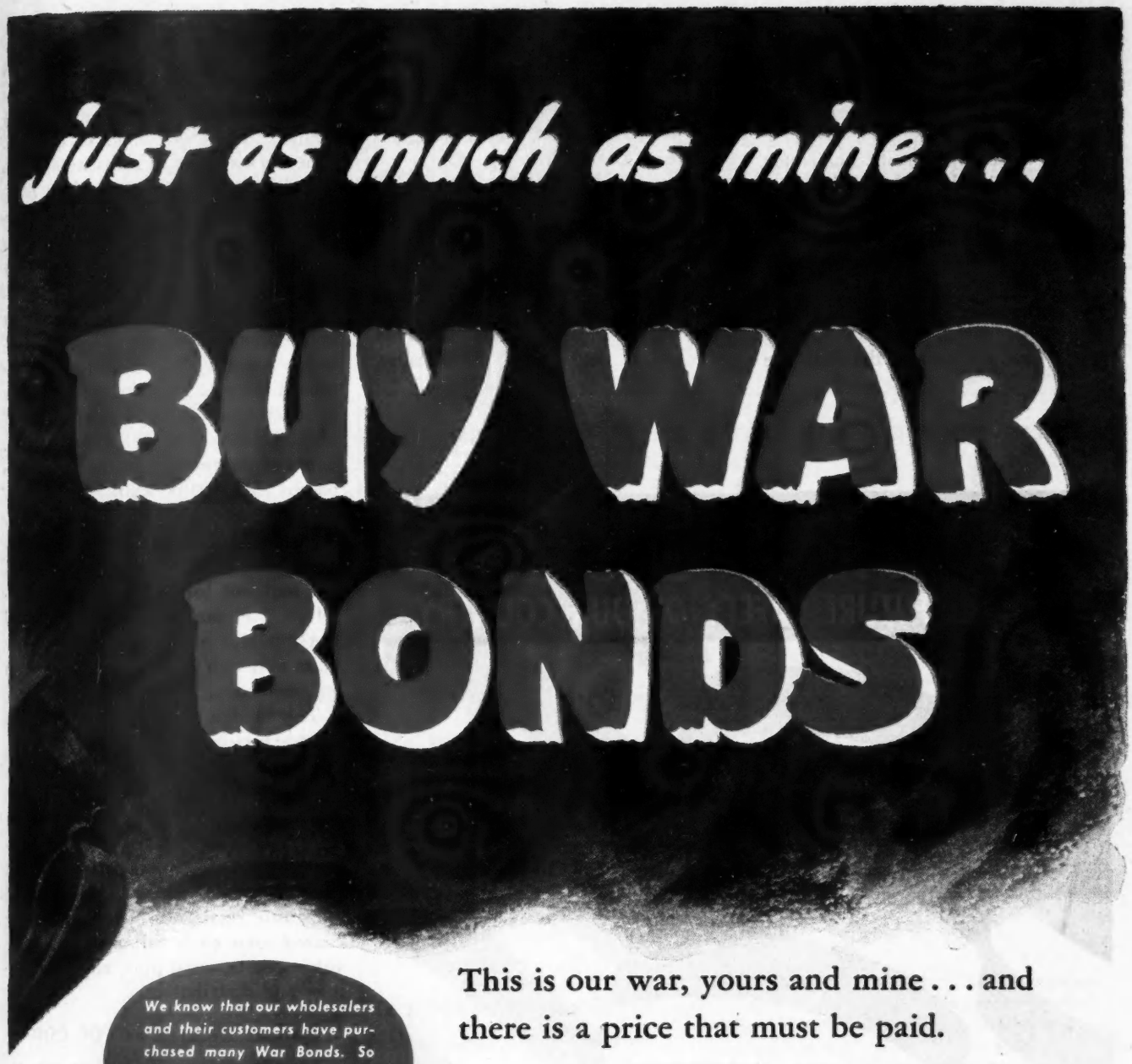
About 2000 tires are in service on this fleet. Replacements total about 225 per month, of which 25 are a result of road failures. Nearly all the road failures are trailer tires. When one trailer dual tire blows out, the other usually lets go, too, because of the increased load it has to carry. Drivers are instructed to stop as soon as is practicable after a tire failure. About a dozen tires have burned up as a result of running on them after a tire blew out; the sudden overload causes the excessive heat to be generated.

The main garage in Dearborn has a complement of 12 mechanics and helpers, four lubrication men, six tire specialists, four trailer service men and one washer and handyman. The repair shop is open 24 hours a day; three of the mechanics, two lubrication men, two tire men, and two trailer repairmen working on the night shift. Before starting out, drivers are given a trip report card on which they are supposed to check 20 items of equipment prior to going on the road. On completion of the trip they hand in the trip report card with the mileage and the tractor and trailer number. They also list any reports or adjustments which they believe the equipment needs. The shop mechanics take these cards and then check any parts or adjustments which the driver has listed as faulty.

The oil is changed every round trip to the Southwest, which ranges from 1800 to 2500 miles. It also may be changed at the southwestern terminus on a new engine. SAE 20 oil is used in the winter and SAE 30 in the summer, although a change may be made to SAE 30 in the winter if the engine's oil consumption goes up. Oil filters and an oil bath on the carburetor both have been found indispensable due to the dust conditions that prevail in the Southwest. Several engines not equipped with the oil bath and filter were burned out on the early hauls to the West Coast when dust storms were encountered in Texas or Arizona. Oil filter cartridges are changed when the oil shows dirt, usually between 7000 and 10,000 miles. Oil filters are cleaned at the same time. Oil consumption is variable, anywhere from 1 to 30 quarts being added on a round trip to Fort Worth.

Engines are tuned up, with the distributor, sparkplugs and carburetor checked, when the driver indicates that some trouble is developing. The major effort is to keep the two engines synchronized. A motor analyzer and a timing light are used in

(TURN TO PAGE 148, PLEASE)



We know that our wholesalers and their customers have purchased many War Bonds. So we add our thanks—and say—Keep it up—Back the Attack—Buy More War Bonds Today!

This is our war, yours and mine . . . and there is a price that must be paid.

Not all can do the fighting. Some must shape the weapons. But all-out war leaves no one out. Not even dollars can stay on the sidelines and win.

Everyone will help by buying War Bonds . . . and we'll win the victory . . . *your victory and mine.*

COMPANY • MANSFIELD, OHIO

Following Well Known Tires—

RICHLAND, UNITED

WHOLESALERS EXCLUSIVELY

A FLEET-DESIGNED DUAL-ENGINE TRUCK

(CONTINUED FROM PAGE 144)

making these adjustments. The clutch adjustment is checked closely on a vacuum gage. Oil and gas consumption, as well as repairs, are listed by the shop foreman on the unit cost record sheet for each tractor unit. These entries are made from the repair order forms on each vehicle, which also are kept in the shop file based on the work done by each mechanic. Repairs made at Dearborn are recorded in blue ink, those at Lebanon in green ink, those at Fort Worth in blue pencil and those made at Ford dealerships or emergency road repairs in red ink.

Engines Rebuilt at 35,000 Miles

Engines are rebuilt on the average every 35,000 miles. When the records show that an engine is using a quart of oil per 100 miles, it is checked to see if new piston rings are needed and if a rebuilding job is in order. New piston rings and spark plugs are installed, valves are reground or replaced and worn bearings replaced. Some of the wartime valves made of substitute material had to be refaced after 5000 miles of operation and sometimes less, but this condition has been remedied since valves of pre-war quality are again available. The second time an engine is rebuilt, at approximately 70,000 miles, the cylinders are rebored. Engines may be rebuilt three times, after which a new cylinder block is needed at the end of 100,000 to 110,000 miles of use. Some of the tractors in the fleet have passed the 200,000 mark in mileage. One mechanic is a specialist in engine rebuilding, completing one engine a day. Some additional engines are sent out for rebuilding. Carburetors, fuel pumps, distributors and water pumps are exchanged for new units although one may be rebuilt in an emergency.

The tandem axle arrangement on the tractors has proved very reliable. So far only a couple of pinion bearings have had to be replaced. However, these axle units must be kept well greased to insure such operation. Transmissions are rebuilt in the shop when necessary. Wartime substitute materials in parts have caused some early failures, including valve inserts, wrist pins, engine bearings and distributors.

Brakes Relined at 100,000

Tractor and trailer brakes are relined on an average of every 100,000 miles. Some trouble has been encountered with broken brake drums on the trailers. The brakes drag on the long hills in Missouri, overheating and cracking the drums, which do not have enough cooling surface. Steel rims are shrunk on the outside of the drums to repair them.

Gasoline Consumption

Gasoline consumption for the dual engine tractors ranges between 2½ and four miles per gallon, depending upon the care and skill of the driver, with a general average of 3½ miles per gallon. Premium grade gasoline is used, but it is estimated that there is an 18 per cent loss in efficiency on the present wartime lower octane motor fuel. Carburetors are set for the

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A FLEET-DESIGNED DUAL-ENGINE TRUCK

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best idling speed and the most efficient "pull", based on a high vacuum point. The spark is retarded slightly to minimize knocking. An additive is now being used experimentally in the gasoline, chiefly with the object of freeing sticky valves.

This fleet of tractors hauling huge trailers, wearing the service olive drab of the Army Air Forces, makes possible one of the longest assembly lines in the world. Bomber subassemblies are prefabricated at the Ford Willow Run plant and then shipped in these trailers to assembly plants at Tulsa and Fort Worth. There they come off the final assembly line as B-24 Liberators ready to carry their loads of death-dealing explosives to drop on the Axis.

END

(Please resume your reading on P. 51)

Black Director of P C Airlines

Robert F. Black, president of The White Motor Co., was elected a director of the Pennsylvania Central Airlines Corp. His selection is a natural one in view of his broad background of knowledge regarding transportation problems and facilities, many of which can be applied to aviation.

New Oxy-Acetylene Handbook

"The Oxy-Acetylene Handbook," published by The Linde Air Products Co., fulfills an urgent need for a complete, comprehensive and authoritative textbook on basic oxy-acetylene welding and cutting procedures. This new durably bound, 600-page manual is invaluable as a guide for self-instruction and also as a standard classroom textbook. It covers the entire range of the oxy-acetylene process, giving clear, easy-to-follow instructions for handling all the common commercial metals, together with simple explanations of the fundamental principles of the various methods of depositing and controlling molten metal. Considerable space is devoted to an explanation of the operating principles of oxy-acetylene equipment and instructions for its care and maintenance. The price is $1.50.


TEETH
that are shaped
for their job . . .
By comparing various animals you see how accurately their teeth are shaped to meet their individual need. Gear teeth, like natural teeth, work at their best when they, too, are shaped to fully meet the job they have to do.
As the result of extensive research and field testing, Fuller developed gear teeth which are shaped differently from ordinary gear teeth—shaped to do their job better. That's why Fuller Gears give you a transmission which has become notable for its quiet running—its easy shifting—its long wear-life. Be sure the transmission in your new truck is a FULLER.
FULLER MANUFACTURING COMPANY, KALAMAZOO, MICHIGAN
Transmission Division
Unit Drop Forge Division, Milwaukee, Wisconsin
Fuller
TRANSMISSIONS

COMING CHANGES IN TRUCK DESIGN

(CONTINUED FROM PAGE 62)

These factors were recognized by the SAE Automotive Transport Code Committee appointed in 1931 to study this problem, and the report approved by the Council in 1935 proposes that the body width be set at 96 in., but that up to the rear fender top line 102 in. be permitted. (See Fig. 2) This additional 6 in. would make possible important design changes in trucks and buses, which would favorably affect both the safety and performance.

Half of this increase alloted to the tire width would provide the desirable improvements in tire mounting, which wider rim bases will produce, affecting both tire life and vehicle stability and safety. (See Fig. 3) The remainder, used to provide longer and wider springs with greater spring centers, will improve riding, reduce shock loading on the vehicle and the road, and improve stability, reducing sway of body and load. The available space for brakes also will be increased and, even though this space is still inside the wheel, important improvements can be made by changing proportions which should increase the space between the drum and the rim, thus making better air flow around the brake possible.

Vehicle Weight

In light of the limitation on gross weights provided by the formula which makes the weight a function of length, it is of interest to consider the possibilities for the three classes of equipment recognized in the length provisions.

A single vehicle is limited to 35 ft. length and, on the basis of normal design practice, a six-wheeler could be set up which would have a rating of 46,000 lb. It would be possible to increase this to a maximum of 54,000 lb. (See Fig. 4) This would be accomplished by pushing the rear axles as close to the rear end as possible and the front axles as close to the front as possible, thus making the controlling distance between the front and rear axles a maximum.

However, this would involve a front axle load of 18,000 lb., and while designs have been proposed for dual tires on front axles which seem to offer some promise, and power steering gears have been developed which would handle an axle load of this amount, there still remain many problems to be solved to make such an arrangement practicable.

The tractor semi-trailer, limited to 50 ft. length, could be rated at 62,000 lb. With the limitation of 18,000 lb. per axle, this would require four axles. (See Fig. 5)

For other combinations, a maximum of 70,000 lb. is indicated. This probably would require five axles, although as with the single unit and subject to the same problems, a four-axle design can be visualized. (See Fig. 6)

Vehicle Performance

From the speed limits which are proposed, an approximation can be made of the horsepower, which should be provided to realize the advantages obtainable from operation on a highway of this character.

Data contained in a Public Roads

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STUDEBAKER SALUTES AMERICA'S SOFT DRINK BOTTLERS

They saved nearly 258,000,000 truck miles last year

THE nation's soft drink bottling industry saved nearly 258,000,000 truck miles last year compared with 1941, according to a report submitted to the National Highway Users Conference by the American Bottlers of Carbonated Beverages.

This is a reduction of about 50 percent—and it was made largely through compliance with the conservation programs of the Office of Defense Transportation.

It was accomplished even though the volume carried by the bottlers' trucks fell only slightly below the pre-war level.

Bottlers acclaim Studebaker truck-saving helps

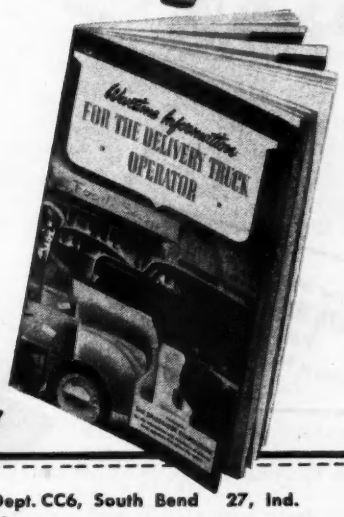
Throughout the soft drink bottling industry, the special wartime services of the Studebaker organization in helping to effect truck conservation have been highly commended.

Bottlers from coast to coast have requested thousands of copies of Studebaker's booklet—"Wartime Information for the Delivery Truck Operator." They find it a reliable ready reference on wartime delivery regulations—a sure source of help in making trucks and tires last longer.

Get your free copy of Studebaker's new booklet and folder

No matter what kind of delivery operations you handle, make sure to get a copy of "Wartime Information for the Delivery Truck Operator" and the special condensed folder "Quick Reminder on ODT Regulations."

This material is obtainable without obligation from any Studebaker dealer or mail coupon to Studebaker headquarters.



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Pioneer and pacemaker in Automotive Progress

NOW BUILDING WRIGHT CYCLONE ENGINES FOR THE BOEING FLYING FORTRESS—MULTIPLE-DRIVE MILITARY TRUCKS—OTHER VITAL WAR MATERIEL

Studebaker Truck Division, Dept. CC6, South Bend 27, Ind.
Send free material checked:
☐ "Quick Reminder" folder.
☐ Wartime Information for the Delivery Truck Operator.

My Name.....

Firm.....

Address.....

City.....*State*.....

COMING CHANGES IN TRUCK DESIGN

(CONTINUED FROM PAGE 152)

report indicates that a total resistance of 30 lb. per 1000 lb. weight for a heavy vehicle is a reasonable assumption. Using this value, we find the following requirements at 60 m.p.h.:

Single unit (46,000 g.v.w.) +245 Hp.

Tractor semi-trailer (62,000 g.v.w) +330 Hp.

Combinations (70,000 g.v.w.) +373 Hp.

Using these values and figuring back, the speeds which can be maintained on the grades provided for, are for all categories 35 m.p.h. on a 3 per cent grade and 21 m.p.h. on a 6 per cent grade. It is, of course, apparent that these represent a considerable increase in power over current practice, and it is quite possible that it will be found impracticable either to provide or to justfy the provision of such high horsepower.

However this may be, an important question is raised when the characteristics of future design are being considered. In general, the objections to high power are first cost, weight and operating cost. The advantages which can be offset against these objections, and which can make them less objectionable, are principally improvement in performance and reliability.

This is no place to argue the matter of first cost, but it is believed that an excellent case can be made for the contention that of two units, the one which initially costs more will be less expensive through its life and will have a longer useful life.

Engine Power Versus Fuel

The weight question presents scope for many interesting speculations. In the engine there are two basic means for reducing the weight in relation to the power produced: (a) by increasing the horsepower per cubic inch displacement; (b) by decreasing the weight.

The first of these involves fuel, design factors and materials; the second, design and materials.

An important consideration with respect to fuel is the octane rating and the resultant effect on compression ratio. A great deal of interest has been aroused by the volume production of 100 octane fuel for airplanes and the performance which this fuel has made possible. A paper by Messrs. Bruce K. Brown and D. P. Barnard (January, 1944, COMMERCIAL CAR JOURNAL, page 57) presents a very capable and realistic discussion of this subject. The authors conclude "that immediately after the war we can expect that the average octane-number level of motor fuel may increase as much as three units over immediate prewar values, and that the majority of the marketers will be able to offer house-brand products around 80 and premium products of, say, 85 octane number. It seems fairly probable that values higher than these would result in extravagances in crude usage which will not be tolerable in the post war period."

It probably will be just as well if this superfuel is not immediately

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COMING CHANGES IN TRUCK DESIGN

(CONTINUED FROM PAGE 154)

available, because the problem of adapting the engine to use it will be more than just shaving some metal from the cylinder head. Parts which will need detail study and development include valves, pistons, rings and bearings as a minimum. There is a reasonable doubt as to whether merely changing the compression ratio will produce the results that are to be anticipated from the use of such a fuel if it became available.

In all probability, the best results would be obtained by the use of a supercharger with little or no modification of the compression ratio. There seems little probability that improvement in power developed per cubic inch will be available from this source in the near future.

Engine Power Versus Speed

Another item which is important is the life expectancy in truck engines as compared with passenger car engines. Truck engines must deliver many times the mileage between overhaul, and also before being worn out, than is acceptable for passenger car engines. Such details as bearings, rings, valves and valve gear and lubrication are the limiting factors in increasing the peak horsepower speed. With some of these, material limitations present the principal problem; in others, design details. Generally, both are combined in varying degrees.

Specialists in all lines are carrying on research and development which have been productive of the results made evident in current practice. It can be confidently expected that progress will continue along these lines.

For the reason that smaller bore dimensions reduce dynamic loading and improve heat conditions in valves and pistons, it can be anticipated that increasing the number of cylinders either on one engine or by mounting multiple engines will receive consideration.

In any event, and by whatever means the result is obtained, it can be confidently expected that peak horsepower and the speed at which it is produced will be increased.

Weight Versus Materials

The second alternative for decreasing the weight penalty incurred by providing more power lies in the possibility of using lighter materials. There are a number of parts which can be made from aluminum, and which already have been, successfully. These include the cylinder head, inlet manifold, cylinder block, crankcase either integral with the cylinder block or not, bearing caps, timing gear case and cover, pan, flywheel housing if separate from the crankcase, and connecting rods and pistons. In addition, there are a number of accessory items such as the fan, water and oil pumps, valve covers, etc., which could be made from aluminum.

Naturally any weight which can be saved in the chassis elements outside the engine will contribute an important share in keeping gross weight down. Parts which seem to offer the most promise are the clutch housing, transmission case and cov-

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ers, power take-off casing, axle gear carrier, axle housing, brake spider, brake shoes, wheels or wheel hubs and front axle eye beam. Hoods, fenders and cab frame and panels also offer fields for study.

However, the basic problem in connection with the use of light metals lies in the question of cost. In pre-war days, the difference in cost was so great that these materials could not be used on a competitive basis. Some information would indicate that this condition may be changed after the war, but the situation is still not sufficiently clear to hazard a prediction on what will happen.

Weight Versus Operation

Another factor in decreasing the weight of the unit lies in balancing the various units in the chassis to the work to be done. To do this will require an understanding attitude on the part of the operator.

It is fairly obvious that the design must take into consideration stresses developed by the weight of the vehicle and the load for the operating conditions that will be encountered. These stresses vary in different members. The frame is principally affected as a load carrying member. The front axle is subject to the load and to brake reaction; the rear axle to the load, to brake reactions and must deliver engine power to the wheels.

It is equally obvious that, since the value of all of these stresses is affected by shock loading, the character of the road influences the design provisions which must be made. On roads, of the type proposed in the Interregional Plan, the type of road surface and the value proposed for grades, as well as the relative freedom from frequent stops in urban areas, all point to the possibility of reducing the weight of many of these units. While this does not mean the vehicles would fall apart if taken off the highway, it does mean that the operator will have to modify speeds when operating on lower type roads to reach the desired destination not immediately located on the highway.

Power Versus Operating Costs

The effect on operating costs of high horsepower is probably too frequently supposed to be all bad. Undoubtedly, this opinion is responsible to a large degree for the use of underpowered vehicles.

Several years ago, an attempt was made to obtain some information on this subject. A tractor semi-trailer of 40,000 lb. g.v.w. was driven between Ardmore and Pittsburgh over the Lincoln Highway and the Pennsylvania Turnpike. Six round trips were made, and the average of the odometer readings for the six trips was 570.7 miles. The distance on the Turnpike was 319.12, and on the rest of the road 251.5.

On the first trip, an engine of 377 cu. in. displacement and a two-speed rear axle having gear ratios of 6.53 and 8.53 were used. On the succeeding runs, larger engines and different axles with different gear ratios

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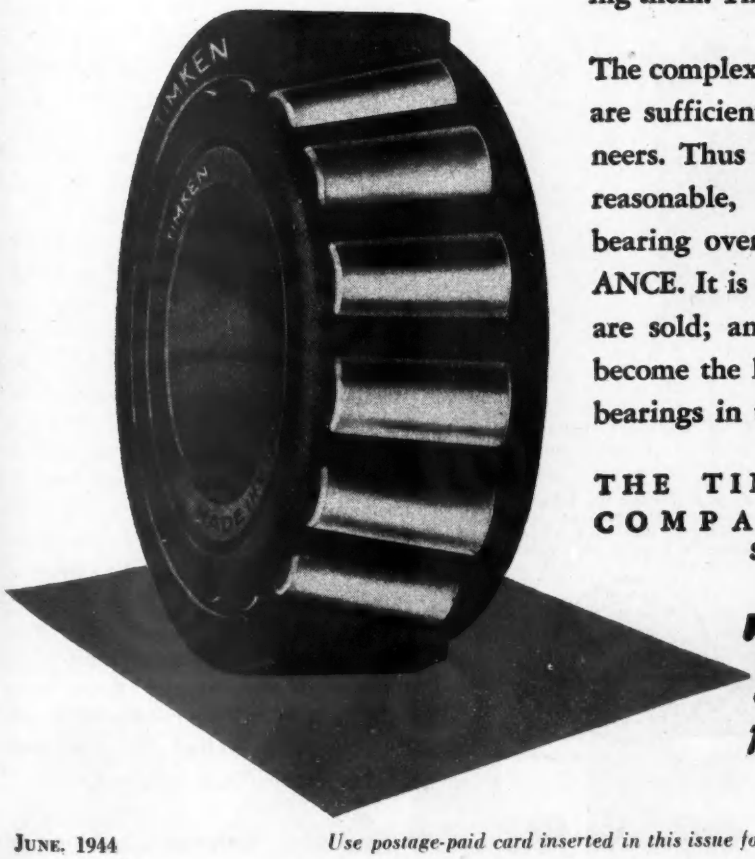
IT'S *Performance* THAT COUNTS



NO ONE feature makes a bearing superior to another. There are dozens of design features in any bearing. There are hundreds of steps involved in the manufacture of anti-friction bearings. All kinds of technique can be used in inspecting them. They can be made from any kind of steel.

The complexities in the art of bearing manufacture are sufficient to baffle experienced bearing engineers. Thus the bearing buyer really has but one reasonable, trustworthy guide in selecting one bearing over another - - and that is PERFORMANCE. It is on this premise that Timken Bearings are sold; and as a result of it that Timken has become the largest manufacturer of tapered roller bearings in the world.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO
SERVICE-SALES DIVISION

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

COMING CHANGES IN TRUCK DESIGN

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were used. For purposes of this discussion, the comparison of trip No. 1, with equipment as noted above, and trip No. 6, with engine of 501 cu. in. displacement and a single speed double reduction axle with a 6.77 ratio, is made in the following table:

Ardmore-Pittsburgh	Round Trip 570.7 Miles	
Pennsylvania Turnpike	Round Trip 319.2 Miles	
Balance Outside Turnpike	Round Trip 251.5 Miles	
	Trip No. 1	Trip No. 6
Engine	377 cu. in.	501 cu. in.
Axle Ratio	6.53-6.53	6.77
	Single Reduction 2 Speed	Double Reduction Single Speed
Running time full trip	18.15 hours	15.37 hours
Time saved		2.78 hours
Running time—turnpike	9.00 hours	7.50 hours
Time saved		1.50 hours
Gasoline consumed full trip	115.15 gallons	115.7 gallons
Gasoline saved	.55 gallons	
Gasoline consumed turnpike	61.7 gallons	63.9 gallons
Gasoline saved	2.2 gallons	

Without attempting to make a detailed analysis, it seems to be clear that the 2.78 hr. saving of time would more than compensate for any difference in fuel consumption (.55 gal.) between the two types of equipment.

The Future

The facts forecast a growing demand for highway transport.

Radical innovations in equipment, such as the pneumatic tire, do not seem to be in anticipation. On the other hand, changes in road structure would create greatly different operating conditions, and form the basis for considerable change in the vehicle.

Conventionally, trucks have been made as a chassis in which to mount the machinery and on which to mount a separate body. The structural advantages to be obtained from making the body the main element of the vehicle have been illustrated in the bus field. Probably all of these advantages could be secured in truck construction if it were not for the fact that there is such a large variety in the body types required. Certain of these, such as tank bodies, would seem to be readily applicable, but consideration of cost and production problems bar the way.

Clear space for loading at the rear is an important requirement in many lines of business. At the same time, the driver undoubtedly must be in front. As the engine and the driver can be associated more easily than the engine and the loading doors, rear engine mounting does not appear attractive except, again, on a limited number of specialized vehicles.

Provisions for the comfort of the driver have an important effect on his efficiency, on the performance of the vehicle and on the safety of vehicle on the road. Carefully designed and manufactured cabs made from metal will make it possible to improve vision by reducing the dimensions of essential structural members. In many cases, the dimensions of cabs must be increased to provide more room in all directions.

Of couse, a truck is designed to carry a load and, with limitations on dimension and weight, there is a definite tendency to reduce sizes and weights of the vehicle in order that

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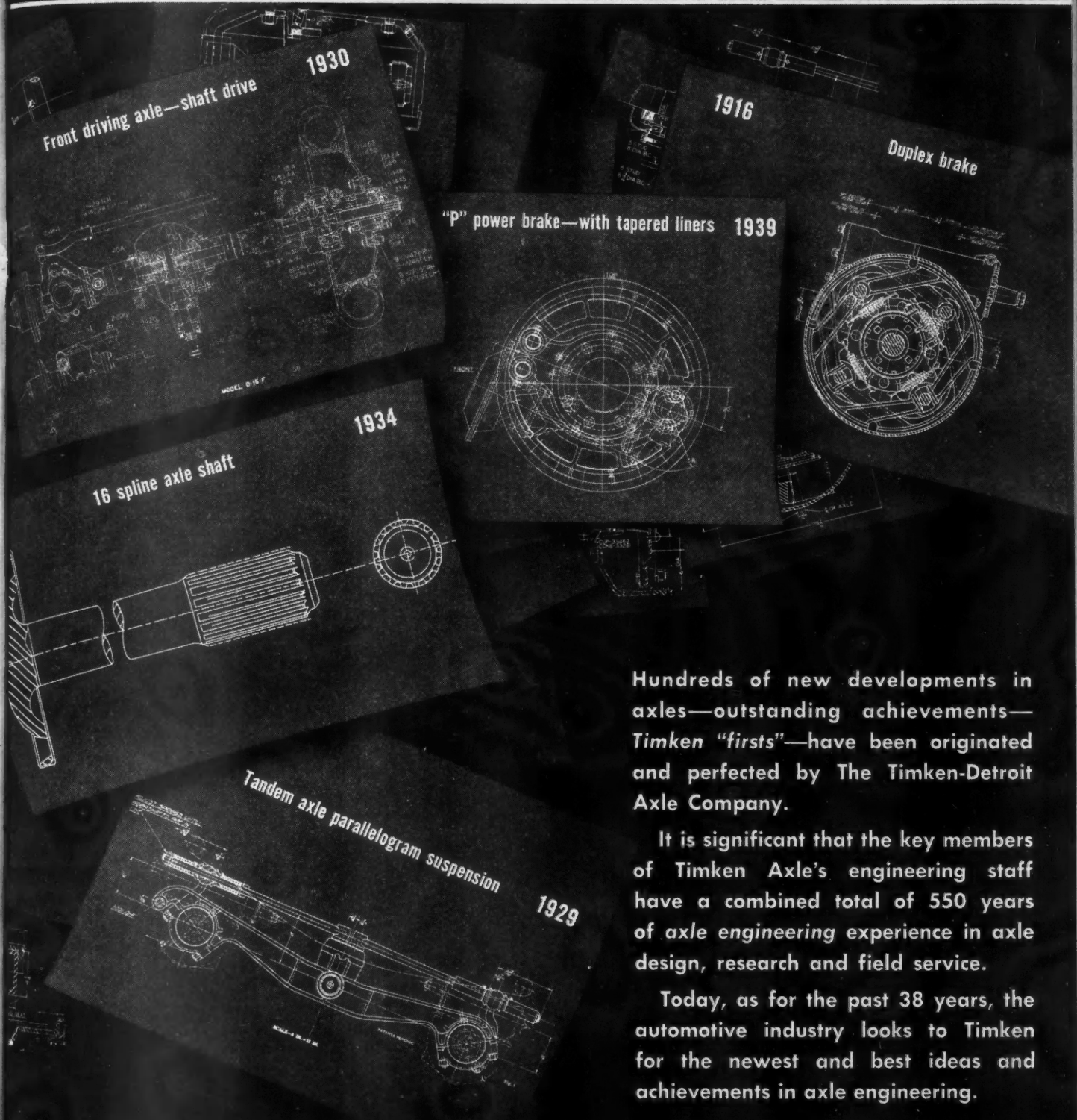
Leadership!



Hundreds of new developments in axles—outstanding achievements—*Timken "firsts"*—have been originated and perfected by The Timken-Detroit Axle Company.

It is significant that the key members of Timken Axle's engineering staff have a combined total of 550 years of *axle engineering* experience in axle design, research and field service.

Today, as for the past 38 years, the automotive industry looks to Timken for the newest and best ideas and achievements in axle engineering.

AXLES

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DETROIT 32, MICHIGAN

WISCONSIN AXLE DIVISION
OSHKOSH, WISCONSIN

COMING CHANGES IN TRUCK DESIGN

(CONTINUED FROM PAGE 162)

a maximum space and load capacity will remain. The time has come when there must be a new deal in this matter, particularly on trucks used for long distance hauling, where the driver is forced to stay in the cab for long periods. On the other hand, where the driver must get in and out frequently, the details of steps and door clearances are of greater importance, but even in these cases, cramped quarters are not good business.

Undoubtedly, passenger car practice has had an unfavorable influence on truck design in this regard as it has had on accessibility. There seems to be a reaction against this tendency setting in on the part of those who have the responsibility of "keeping 'em rolling." Most designers will sympathize with this attitude, but unfortunately it frequently happens that the man who runs the equipment is not the man who buys it, and the latter shares the common trait of being impressed by superficial appearances.

It is not intended to criticize the so-called stylist and to make a case for the car designer. Rather, the purpose is to point out that these matters require the close coordination of the two skills, which will produce a design that provides for the practical necessities as well as a good, commonsense appearance.

Noise is another item which calls for intensive study. Present vehicles make entirely too much racket, affecting both the occupant and the person outside. The results which have been obtained in this particular on modern street cars should provide a powerful stimulus for work on this problem.

"Evolution Not Revolution"

When will these things be? is a common and natural question to all of these speculations. A statement made so frequently in recent months that it is becoming as tiresome as some of the radio commercials is, "Evolution not revolution." Probably no one is capable or willing to answer this question. Some people don't know and those who do or think they do, are not ready to commit themselves.

There is a distinct possibility that someone may make a very radical departure from current practice because, undoubtedly, when the present barriers are removed, there will be keen competition to obtain an advantage in the market which will exist in the truck field. If such a novelty finds acceptance with the buyer, then others must follow or be left behind; no matter how sensible it may seem to progress slowly and certainly.

(Excerpted from paper presented at a meeting of the SAE Pittsburgh, Pa., Section)

END

(Please resume your reading on P. 63)

Edison Appoints Two New V-P's

Announcement is made by Thomas A. Edison, Inc., of the appointment of two new vice-presidents. They are K. G. Berggren, manager of the special products division, and C. D. Geer, general manager of the company's instrument division. Both will continue in their present capacities.

AVAILABLE THROUGH YOUR AC WHOLESALER

PROTECTION

FOR THE HEART OF THE FUEL SYSTEM

You get reliable performance and long life from your AC Fuel Pumps because *the quality is built in,* from blueprints to finished products. You will best protect that performance and durability if you install AC Authorized Factory Rebuilt Pumps (when replacement is necessary), or rebuild your present pumps with AC Diaphragm or Parts Kits.

AC FUEL PUMPS

8 REASONS WHY AC PUMPS AND PARTS ARE SAFEST

- ★ Careful control of pressure and flow assuring correct fuel supply.
- ★ Accurate hardening, precision machining of parts essential to long life.
- ★ Accurate control of spring tensions and temper.
- ★ High, and controlled, pin hardness.
- ★ 4-layer, patented-impregnation diaphragms of special airplane cloth.
- ★ Carefully finished rocker arm pads, located to center on cam.
- ★ Split-hair rocker arm clearance and control of pad hardness.
- ★ Uniform pull rod hardness at pin holes.

SEND FOR AC SHOP MANUALS

Field Service Department, AC Spark Plug Division, G. M. Corp.
910 Union Industrial Building, Flint, 3, Michigan ♦ CCJ-6

Gentlemen: Please send at once, no charge, the AC Shop Manuals checked:

- ☐ How to Service Spark Plugs
- ☐ How to Service Spark Plug Cleaner
- ☐ How to Service Oil Filters
- ☐ HOW TO SERVICE FUEL PUMPS
- ☐ How to Service Air Cleaners
- ☐ How to Service Speedometers
- ☐ How to Service Ammeters and other Instruments

NAME_____

FIRM_____

STREET ADDRESS_____

CITY_____ STATE_____

INTEGRATION NOT IN THE PUBLIC INTEREST

(CONTINUED FROM PAGE 63)

ponents, will stop the exploitation of one form of transport to the advantage of another at public expense; eliminate the vast wastes in capital expenditures and duplicated services, the cost of which the public must also defray; develop all types of facilities, one related to the other, so that shippers and consumers will receive the most convenient and efficient service at the lowest possible cost; permit equality of regulation; reduce wastes and duplications to a minimum; afford the lowest basis of rates for the shippers and consumers; have a maximum degree of support for the security of private investment; and provide for the constructive application of the competitive principle. A prerequisite to the proposed corrective measure is a valid situation.

If we accept the foregoing we cannot escape the implication that our present transportation services are insufficient, operation is incompetent, freight rates are exorbitant, discrimination is rampant, wastes are almost beyond comprehension, exploitation by evil persons for no purpose, and unsatisfactory service to the public, all caused by our present system of competitive transportation.

No one who believes in the private enterprise system doubts the advantage and the need for open competition. In fact, ethical competition is the mainspring of the private enterprise system. Therefore, anything which destroys competition strikes at the root of private enterprise and promotes either monopoly or bureaucracy.

In order to secure the benefits of competition, there must be some waste due to duplication. Where there is a monopoly, there need be no duplication but the benefits of competition cannot be enjoyed. The integration of the transportation facilities of this country into 12 to 18 companies will eliminate duplication in a large degree, but, at the same time, we would have to forego the benefits of competition.

An examination of the Freight Traffic Report, issued by Coordinator Eastman, discloses that there are approximately 35,000 communities which have direct railway service but there are 54,000 communities which do not have such facilities. However, approximately only 3000 are served by two or more railways. Under the proposed scheme of integration less than 50 per cent of our population will have the benefits of competitive transportation service.

The proponents of integration admit rather reluctantly that there will be monopolistic trends but claim that the competition between the 12 to 18 companies will be sufficient. This conclusion is extremely questionable due to the fact that the proposal for integration is to eliminate duplication of services, and where there is only one company there can be no competition.

In support of a transportation monopoly by 12 to 18 companies, the operation of the telephone and telegraph industry, a monopoly, is cited. It is to be granted that the operation of this industry is reason-

(TURN TO PAGE 170, PLEASE)

"The way they are talking about his 'line'—
he must be a Weatherhead Salesman!"

THE WEATHERHEAD "LINE" · FITTINGS · FUEL LINES · DRAIN COCKS · DASH CONTROLS · BRAKE PARTS

INTEGRATION NOT IN THE PUBLIC INTEREST

(CONTINUED FROM PAGE 168)

ably satisfactory to the public. However, it should not be accepted as a criterion that 12 to 18 transportation monopolies would be equally so.

A Modified Program

The railroads have recently presented a modified plan for integration in which they are asking that legislation, national and state, be enacted which would permit them to enter any and every field of transportation that they might desire. They claim by such a program the public service would improve and that the traveler or shipper could go to a transportation company and learn what medium of transportation, or combination of media, would serve him best. It is further claimed that the shipper has little or no interest in the means by which his goods are transported, and that the carrier is much more competent to determine these matters for him. The soundness and accuracy of these conclusions are questionable. The public has not forgotten when the New York, New Haven and Hartford Railroad, for a period, was engaged largely in operating all types of transportation, railways, steamboats, trolley lines, and motor buses in New England, from which the public received poor services and the investors lost heavily.

At the beginning of this century, the land carriage in this country was largely monopolistic in the hands of the railway industry. The complaints of service at that time were legion, which led to extensive regulation.

The public's main interest in the operation of any enterprise, private or public, is the service the public receives and its experience in dealing with monopolies has been far from satisfactory. In addition to the public welfare, the public has a secondary interest in the welfare of the owners (stockholders) of the property. Monopolies, as a rule, are a combination of many companies. The organization of the parent company or its operation has been too often to the undue advantage of a certain group to the injury of stockholders of subsidiaries. It was these facts that brought holding companies into such ill repute.

The public is not antagonistic to the railroads; its attitude is just the opposite. Neither is it against big business. Our form of government provides and contemplates big business is free and expected to conduct its affairs in the interest of its owners, subject to authorized restraints. The principal purpose of railways in presenting a modified plan of integration was for their own advantage and not for public interest or any other form of transportation or business. The railways should not be subject to criticism for this, in that it is according to our system of democracy.

If this proposal is in the public interest it should be approved. If the public interest is being jeopardized, the government should enact restraints with reference thereto.

Competition

It must be recognized that the welfare of the public is dependent upon

(TURN TO PAGE 173, PLEASE)

INTEGRATION NOT IN THE PUBLIC INTEREST

(CONTINUED FROM PAGE 170)

the welfare of our business institutions, and, where a matter has received as much emphasis as the alleged evils of competition, it merits investigation.

One of the first questions to arise in an inquiry of this kind is the actual amount of competition of which complaint is made for its importance is in proportion to its values. We are fortunate in that we have a government report (Interstate Commerce Commission), just issued, which gives the volume of traffic for recent years. This is shown in the table on page 63.

In the table attention is called that the ton-mile traffic on inland waterways, 90 per cent of which is on the Great Lakes, and that furnished by pipe lines amounts to 23.6 per cent. Certainly the traffic handled by these agencies cannot be said to be in competition with other modes of transportation.

Of the 4.6 per cent of total traffic handled on the highways only 2.8 per cent is for-hire traffic, part of which is a service to communities not reached by any other mode. However, should the whole 2.8 per cent be considered to be in competition with other modes, it is certainly of very little consequence.

Of the 71.8 per cent handled by the railways it is reasonable to say that at least 80 per cent of this traffic is not in competition with any other mode of transportation, otherwise the volume of traffic would not be so large.

One of the principal, if not the controlling elements in a competitive situation, is the charges for services (freight rate). The average freight rate on pipe lines and inland waterways is only 1/5th of that of the average railway rate, and 1/15th of the average motor truck rate, indicating there is little or no competition with other modes of transportation. That part of the traffic of the highways and railways having comparable freight rates is competitive. Where there is a wide difference in the rate, there can be no competition for the traffic.

To say that the service one renders one's self is competitive with organized businesses is, in the least, a much strained interpretation.

Conclusion

The implication, contained in the statements of those urging integration of our various modes of transportation, is that the operations and property of these agencies are in extremely dilapidated condition, possibly only a little better than the Deacon's "One Hoss Shay." The most casual inquiry repudiates unqualifiedly such a conclusion.

The consignor, consignee, and ultimate consumer is served today by a greater number of agencies with a better quality of service, and at as low or a lower cost, than ever before in history. During the last decade there has been little or no complaint from these.

In light of the unusual quality of transportation services the American public has been enjoying, it is difficult to see wherein the present general plan of a number of agen-

(TURN TO NEXT PAGE, PLEASE)

INTEGRATION NOT IN THE PUBLIC INTEREST

(CONTINUED FROM PAGE 173)

cies operating independently of each other, with the present limited amount of competition, has created any demand or that it will be in the public interest to abandon the present scheme of operation. Neither is there any evidence that revolutionary changes should be made to the present plants and operations of any of the agencies.

From the viewpoint of the transportation agencies themselves, it is difficult to see that the competition between them, which is quite limited, is to their detriment, and it would be unfortunate both for these agencies and for the public were this competition eliminated. In their aggressiveness under competitive pressure it is possible that they at times have taken action which has not been to their best interest.

The competitive situation is largely reflected in the charges for services. Carriers in some instances will offer their services at rates which are not fully compensatory. If the agencies would predicate their rates upon the cost of service, and *as a rule* would not carry at a charge less than the full cost, the situation would be greatly improved and the various carriers would find themselves rendering that service which they can do economically and best.

It is difficult to see where the public interest, or even that of any of our transportation agencies, would be benefited by abandoning a tried and proved system of competition, which at present is without public complaint, and adopting in lieu thereof an entirely new program. Integration, instead of a means of preventing government ownership and preserving the free enterprise system, is more likely of being a sure and direct route thereto. It would seem imperative that before any such plan is finally adopted an extensive survey should be made thereof which would report not only the advantages of integration, as has been done by the proponents of this scheme, but the unfavorable ones thereof which should be compared with the favorable and unfavorable aspects of our present plan of transportation operation by competitive modes.

END

(Please resume your reading on P.64)

White Motor Co. regional managers and home office executives, including the Canadian subsidiary, discussed war and post-war problems at a five-day meeting in Cleveland

Victor Holt, assistant manager of Goodyear's tire department, now heads that organization, supervising automobile, truck and tractor tire sales, also the petroleum sales and service department activities

Remember when ...

—you could stop on a dime-and get 9¢ change?

In prewar days, it didn't matter so much that "nose dive" stops and fast starts wore tires smooth 3 times as fast as normal.

But it *does* matter NOW! Urgent military needs leave *very few* truck tires for even the most essential civilian use. America's vital motorized freight system can well collapse —unless every tire now in use is made to last! Make *yours* last.

GO EASY ON STOPS AND STARTS— and *keep rolling* AT VICTORY SPEED!

INSIDE FACTS ABOUT RUBBER

This is the most critical period to date in the truck tire situation. Although the tire industry is winning out over shortages of men, materials and machines to increase production each month, *almost all* of that production is allocated for military needs. At the same time *more and more* of the tires-in-use are wearing out. Only the most intelligent and faithful tire conservation can keep America's essential trucks on the road. Do your part.

SEIBERLING

Heat-Vented TRUCK TIRES

Built by *Experts in Rubber*

OVERLOADS OVERHEAT SYNTHETIC TIRES

(CONTINUED FROM PAGE 55)

transportation will fail. The drivers of these tires are destined to play an important part in the future of the rubber program.

Most of the larger size highway truck tires are now made with a substantial percentage of synthetic rubber. A higher percentage of synthetic rubber will be used before, or no later than October 1. We are now at a point where the industry must build truck tires largely of synthetic rubber or provide no tires at all.

Rules for Maximum Mileage

Present synthetic truck tires give much better performance than they did a year ago, but still are not as good as pre-war tires. Below are a few simple rules which, if followed, can result in synthetic truck tires giving reasonable, satisfactory service.

1. *Do not overload.* Know the Tire and Rim Assn. rated load for the tires you use, and load your equipment so the tires will not be forced to carry more than this load per tire.

2. *Hold speeds to the victory speed limit.* High speed causes heat which in turn can cause heat blow-outs and tread and ply separation. It's the main cause of fast tread wear.

3. *Do not over-inflate.* Use the air pressures recommended by the Tire and Rim Assn. and do not vary these unless a thorough analysis is made of your operation in order to arrive at specific pressures which will apply to your operation.

4. *Do not operate tires under-inflated.* Check air pressures when tires are cold before every trip or at least three or four times a week. Check valve cores and replace those that leak. Keep valve caps on valves at all times.

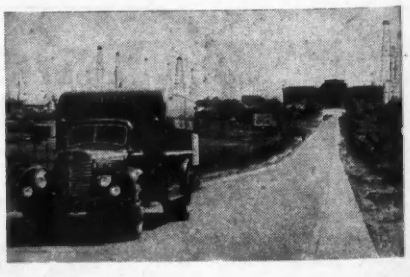
5. *Dual tires must be twins.* Match them for outside diameter. If necessary to use a slightly larger tire on a dual wheel, mount it on the outside. Do not run a cotton tire with a rayon tire on the same dual wheel nor mount a synthetic tire with a rubber tire on the same dual wheel.

6. *Drive carefully. Start and stop slowly.* Anticipate stops, so brakes can be put on gradually. Drive around breaks in the pavement. Do not swerve on and off the pavement.

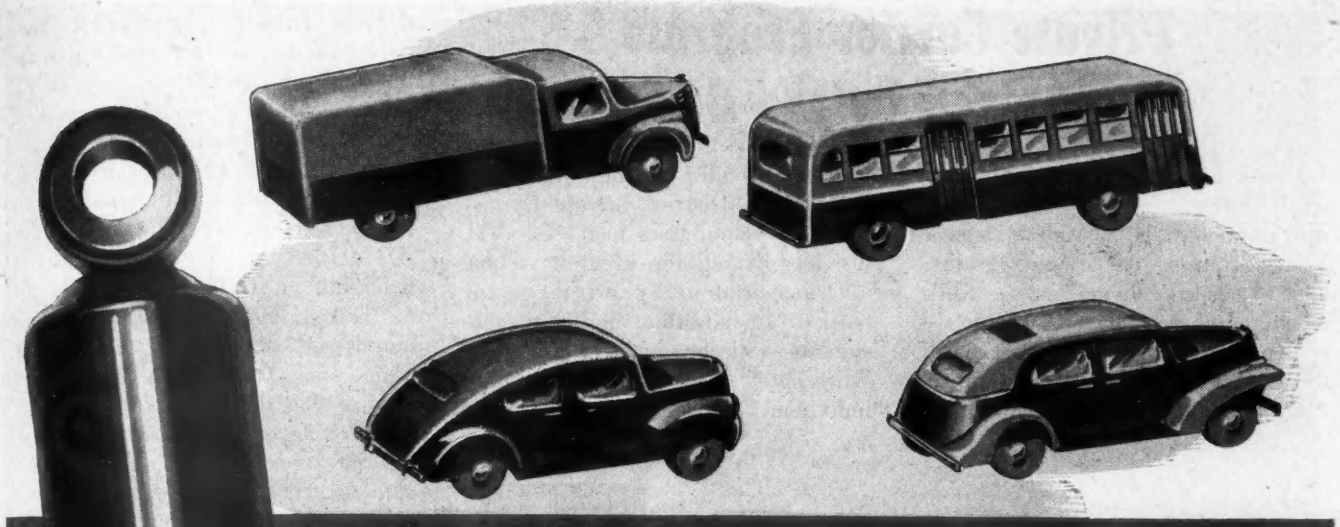
7. *Correct mechanical irregularities.* Watch brakes, wheel bearings, alignment springs, and rims. When uneven tread wear shows up, find the cause at once and correct it.

END

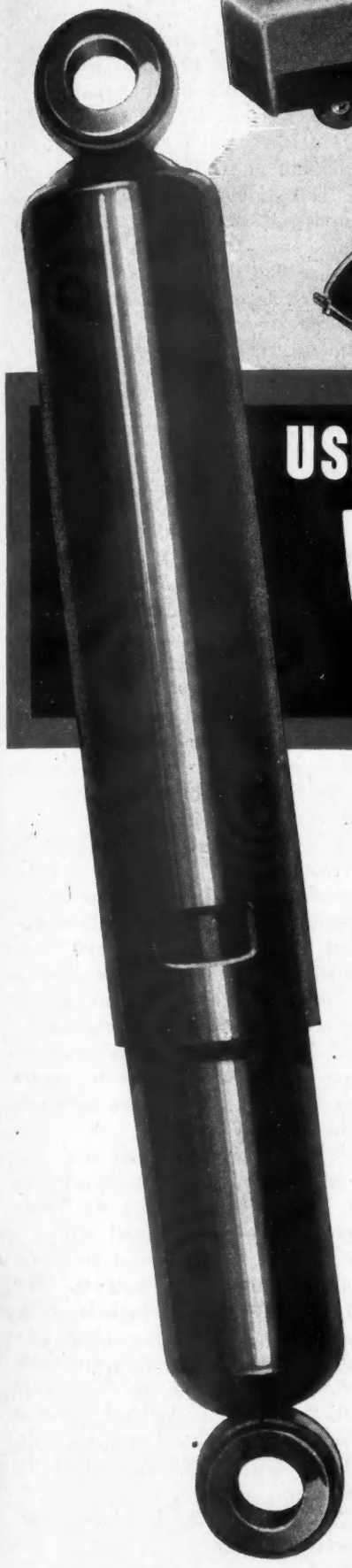
(Please resume your reading on P. 56)



Despite the fact that every over-the-road truck of the Mistletoe Express Service Inc., fleet has traveled more than 200,000 miles, with three over 1,000,000 miles each, the vehicles are in top condition. The streamlined International illustrated traveled 451,660 miles when the photograph was taken



USE WAR TESTED Monroe Shock Absorbers



Save Costly Damage . . . Save Lay-Up Losses . . . Save Man Power . . . Save Space . . .

Many fleet owners, bus and truck operators are solving some of their current problems of maintenance by using war-tested Monroe Shock Absorbers. Monroes are used to replace damaged and worn out Shock Absorbers . . . to reduce tire wear . . . to prolong the life of war-vital motor equipment.

Monroe Shock Absorbers are easy to install. They are engineered to meet your needs . . . are rugged . . . dependable . . . cost less, and are backed by a company with a reputation of 28 years.

Monroe engineers are abreast of the modern needs in hydraulic controls for vital war equipment on land, in the air and on the sea. They have pioneered in this field and will help you with your problems if you will write us about them.

MONROE

MONROE AUTO EQUIPMENT CO. . . MONROE, MICH.

Private Carrier Program Organized by the ODT

Close cooperation, at the local level, between private motor truck operators and the Office of Defense Transportation—to assure continuance of needed delivery services while effecting all possible conservation—is provided in the new program of the ODT Private Carrier Section.

Opportunity for such cooperation will be provided through the establishment of District Private Carrier Advisory Committees in the 33 ODT districts having the greatest volume of transportation by private motor trucks. In addition, industry consultants will be brought into the Washington office of ODT to study individual industry problems and develop industry conservation and preservation plans for application in the field through the appointment of Industry Advisory Committees where a need is indicated.

Each District Private Carrier Advisory Committees will consist of five or seven men, depending upon the size of the city. Instructions to the field staff of ODT for the setting up of these Committees are being prepared and sent out to the District Managers. Instructions specifically require that the names of only bona fide private operators are to be considered for committee personnel (including truck rental representatives engaged only in leasing and not in for-hire carrier operations, in areas where there is a substantial amount of truck rental to private carriers).

Committee functions will include the following:

1. Action as a confidential over-all advisory committee of private operators with respect to all matters on which the District Manager may feel the need of consultation.

2. Assistance in the formation of individual Industry Advisory Committees as required, including recommendations on the determination of industries, selection of locations in which to be established and the securing of personnel.

3. Collection of factual data on private truck operation as desired, including condition and numbers of equipment, availability of idle equipment, the parts situation, and other similar data which might be of assistance to ODT as a claimant agency for civilian motor transportation.

4. Development of a program for cooperation by industry to secure more complete compliance with outstanding ODT orders.

5. Review of programs and proposals which may be submitted to the District Manager by the Washington office and counsel with respect to the application of such programs in individual districts. The subject matter would include industry programs, joint action plans, procedures, regulations and instructions.

6. Where feasible, to experiment with "share-the-trucks" programs as a local neighborhood activity only, with no national advertising of the program.

7. Assistance in handling manpower problems.

8. Action in an advisory capacity

(Turn to Page 180, Please)

PREST-O-LITE "hits the spot!"

THE BATTERY WITH A ... KICK

"Because of the excellent experience we have had with Prest-O-lite batteries in our fleet, we would not hesitate to recommend this product to other operators," writes Bruce E. Melchor of the Pepsi-Cola Bottling Company, Norfolk, Virginia.

The Pepsi-Cola fleet of delivery trucks really gets around. In short runs and long runs, at all times of the day and in any kind of weather, these trucks are on the road. Pepsi-Cola's experience is typical of the rugged low-cost performance fleet owners from Maine to California are getting from Prest-O-lite. Put Prest-O-lite batteries on test in your fleet. See your supplier or write to

BUY WAR BONDS

PREST-O-LITE BATTERY COMPANY, INC.
INDIANAPOLIS 6, • INDIANA

Manufacturing Plants at:
Niagara Falls, Indianapolis, Atlanta, Oakland, Oklahoma City, Toronto

Replace with

prest-o-lite

A GREAT NAME...A GREAT BATTERY

(CONTINUED FROM PAGE 178)

in consideration of appeals arising from the administration of certificate regulations.

9. Possible activity in an advisory capacity on problems with respect to the relations between shippers and for-hire carriers within the district.

As rapidly as possible consultants are to be drawn into the Washington office from each of the more important industries operating private motor equipment. The number of vehicles operated by the respective industries will determine largely those which will be first handled, such as bakery, dairy, beverage, laundry, dry cleaning and one or two divisions of the food industry. Later a similar procedure can be extended to florists, department stores, fruits and vegetables, lumber, meat packing, feed industries and others. In making selection of industries and in subsequent study, it is understood that the individual industries and their trade associations will be consulted.

The individual consultant when selected from each industry will gather factual data as rapidly as possible, from which an industry conservation and preservation program will be developed for application in the field. Such plan will be worked out with the Washington ODT staff, then sent to district offices and the industry committees in those offices through which it would be made effective.

Following are the 33 districts within which District Private Carrier Advisory Committees are to be established:

Region 1—New York, N. Y.; Boston, Mass.; Newark, N. J.; Buffalo, N. Y.; New Haven, Conn.

Region 2—Pittsburgh, Pa.; Philadelphia, Pa.; Baltimore, Md.; Harrisburg, Pa.; Washington, D. C.

Region 3—Memphis, Tenn.; Atlanta, Ga.; Birmingham, Ala.; Columbia, S. C.

Region 4—Cleveland, Ohio; Detroit, Mich.; Toledo, Ohio.

Region 5—Chicago, Ill.; Minneapolis, Minn.; Indianapolis, Ind.; Milwaukee, Wis.

Region 6—St. Louis, Mo.; Omaha, Neb.; Kansas City, Mo.

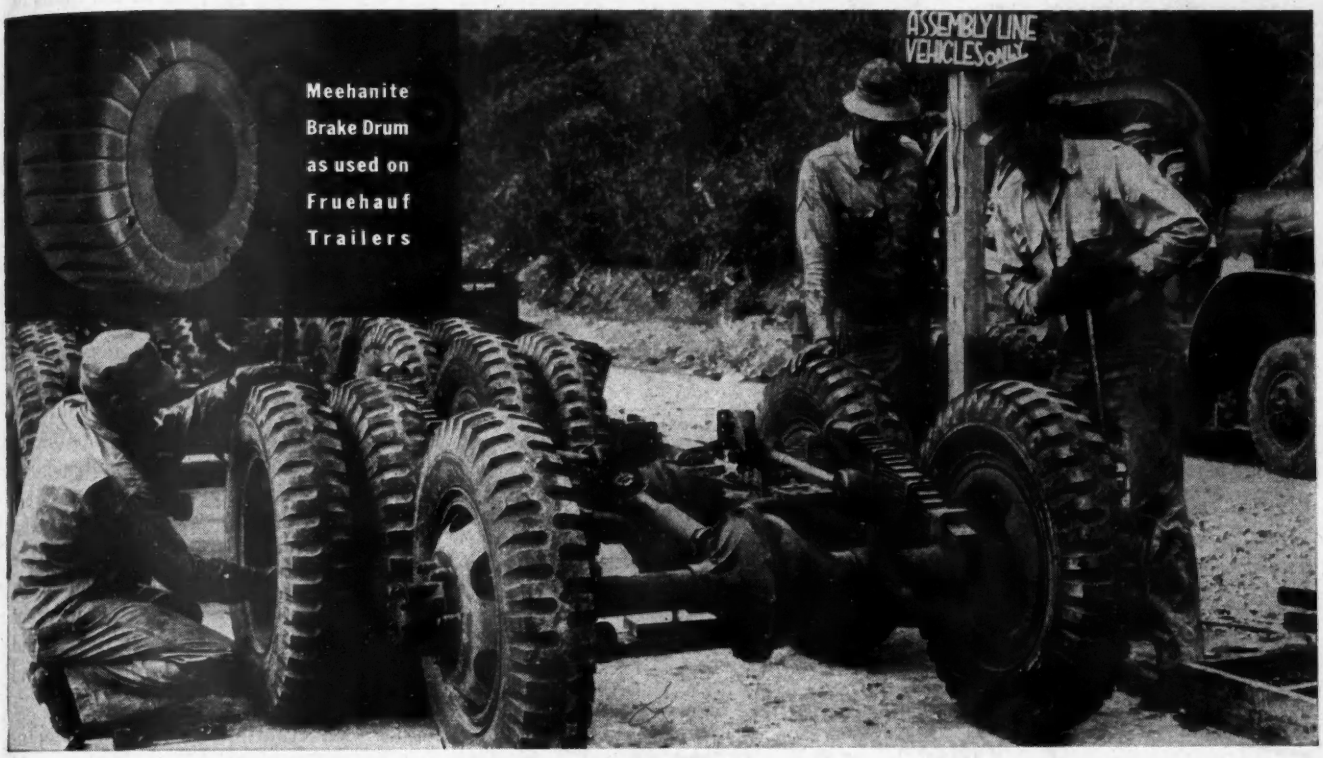
Region 7—Dallas, Tex.; San Antonio, Tex.; Houston, Tex.

Region 8—Denver, Colo.

Region 9—Los Angeles, Cal.; San Francisco, Cal.; Seattle, Wash.; Sacramento, Cal.; Portland, Ore.

Meehanite Brake Drums

Serving on Battlefronts—and at Home



Timken Axles with Meehanite Brake Drums at a South Pacific outdoor "assembly line".
Photo Courtesy Timken-Detroit Axle Co.

These Meehanite foundries are ready to serve you NOW!

ALLENTOWN, PA.	Traylor Engineering Company
ANSONIA, CONN.	Farrel-Birmingham Co., Inc.
BIRMINGHAM, ALA.	Continental Gin Co.
BRIDGEWATER, MASS.	The Henry Perkins Co.
BROOKLYN, NEW YORK	E. W. Bliss Company
BUFFALO, N. Y.	Pohlman Foundry Co., Inc.
CHARLESTON, W. VA.	Kanawha Manufacturing Co.
CHATTANOOGA, TENN.	Ross-Meehan Foundries
CHICAGO, ILL.	Greenlee Foundry Company
CINCINNATI, OHIO	Cincinnati Grinders Incorporated
CINCINNATI, OHIO	The Cincinnati Milling Machine Co.
CLEVELAND, OHIO	Fulton Foundry & Machine Co.
DENVER, COLO.	The Stearns-Roger Mfg. Co.
DETROIT, MICH.	Atlas Foundry Co.
FLINT, MICH.	General Foundry & Mfg. Company
HAMILTON, OHIO	The Hamilton Foundry & Machine Co.
HAMILTON, ONTARIO	Otis-Fensom Elevator Company
IRVINGTON, N. J.	Barnett Foundry & Machine Co.
JEANNETTE, PA.	Elliott Company
LOS ANGELES, CALIF.	Kinney Iron Works
MILWAUKEE, WIS.	Koehring Company
MT. VERNON, O., GROVE CITY, PA.	Cooper-Bessemer Corporation
NEW YORK, N. Y.	The American Brake Shoe Co.
OAKLAND, CALIF.	Vulcan Foundry Company
ORILLIA, ONTARIO	E. Long, Ltd.
PHILADELPHIA, PA.	H. W. Butterworth & Sons Co.
PHILADELPHIA, PA.	Florence Pipe Foundry & Machine Co. (R. D. Wood Company, Selling Agents)
PHILLIPSBURG, N. J.	Warren Foundry & Pipe Corp.
PITTSBURGH, PA.	Rosedale Foundry & Machine Co.
PORTLAND, OREGON	Crawford & Doherty Foundry Co.
ROCHESTER, N. Y.	American Laundry Machinery Co.
ST. LOUIS, MO.	Banner Iron Works
ST. PAUL, MINN.	Valley Iron Works
SEATTLE, WASHINGTON	Washington Iron Works

ASSOCIATED COMPANIES

LONDON, ENG.	The International Meehanite Metal Co., Ltd.
WATERLOO, N. S. W.	Australian Meehanite Metal Co., Ltd.
JOHANNESBURG, SOUTH AFRICA	Meehanite Metal Co. (S.A.) (Pty.) Ltd

Because Meehanite Brake Drums give longer life, smoother braking and freedom from maintenance, they are found on thousands of vehicles shipped overseas for service in war zones.

The specialized metallurgical structure of Meehanite brake drum metal provides high strength, toughness and rigidity, plus resistance to braking heat. The net result is longer life of lining and drums, smoother action, dependability.

Hundreds of thousands of road miles under all sorts of operating conditions proves that the particular combination of engineering properties provided by Meehanite brake drum metal give the kind of service you want.

The complete story has been digested in our bulletin "BRAKE DRUMS". Write for your copy today!

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RESEARCH INSTITUTE
NEW ROCHELLE . . . NEW YORK

Federal Transportation Authority Proposed

The transportation Board of Investigation and Research on May 16 transmitted to the President and the Congress a preliminary report on its studies of the "Relative Economy and Fitness of the Carriers" conducted pursuant to the Transportation Act of 1940.

Principal recommendations were for legislative amendments that would promote adequate rail, motor, and water transportation services, and for creation of three permanent Federal agencies, as follows:

(1) *Federal Transportation Authority.* — To be an independent agency, or a part of the Department of Commerce. The new body would continuously study the country's transportation needs, and submit reports, plans, and recommendations to the President and to the Congress.

(2) *Office of Public Transportation Counsel.*—To be an agency of the Department of Justice, which would represent the general public interest in all appropriate proceedings before transportation regulatory bodies.

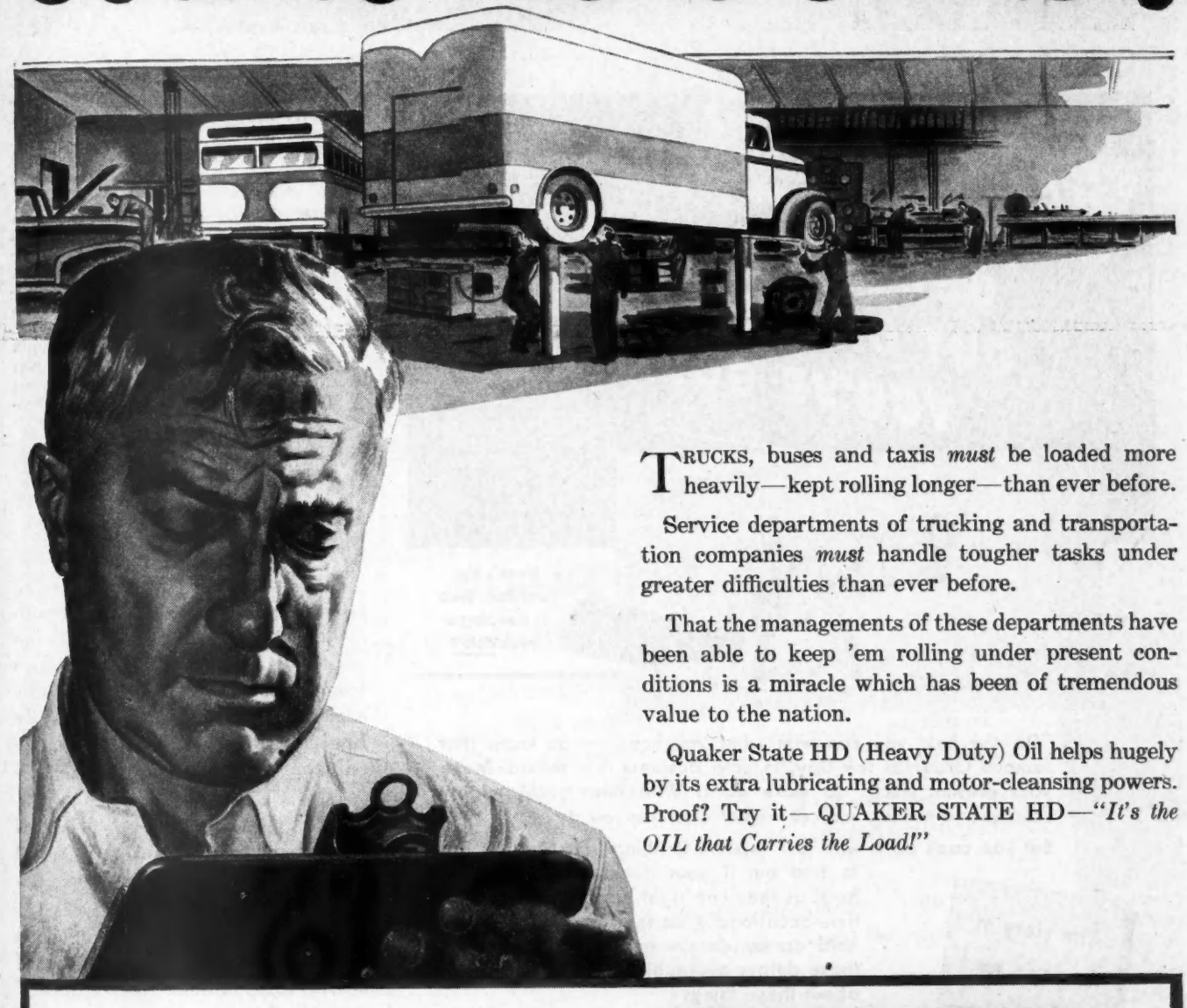
(3) *National Transportation Advisory Counsel.*—To be composed of representative persons in the fields of transportation, finance, agriculture, labor, industry, and public service, named by the President and confirmed by the Senate. The Council would meet with, advise, and criticize the other transportation bodies, and report on their activities to the President and to the Congress.

The Board, a temporary body, whose duties terminate next September under statutory mandate, also proposed that the transportation policy of Congress be amended. The amendment would provide that the transportation services of all common carriers be furnished in such a manner that the shipper will have a freedom of choice in the selection of reasonable joint routes and rates by the use of such transportation agencies and facilities of the same or different types as may be needed to foster and serve commerce economically and efficiently.

In effectuating this policy, the Interstate Commerce Commission would be empowered to require carriers by rail, water, and motor to establish reasonable joint through routes and facilities for the transportation of property with reasonable joint rates, charges, classifications, rules, and regulations. All rates and charges would be free from injurious discriminations, preferences, prejudices, or inequalities and be in reasonable relationship to the cost of the service and the carriers' revenue needs. The amendment also proposes that there be freedom from any restrictions on competition which have the effect of increasing the cost of the service to the public.

The Board named three objectives which it considers basic requirements for an efficient transportation system: (1) Provision of opportunity and encouragement for each agency to operate with the greatest possible economy and efficiency in the field where it can best serve the public; (2) establishment of rates and charges which are related to the cost of providing the services rendered by each type of carrier agency; and (3) abolition of all injurious discriminations in rates and services.

Days that try motor service men's souls!



TRUCKS, buses and taxis *must* be loaded more heavily—kept rolling longer—than ever before.

Service departments of trucking and transportation companies *must* handle tougher tasks under greater difficulties than ever before.

That the managements of these departments have been able to keep 'em rolling under present conditions is a miracle which has been of tremendous value to the nation.

Quaker State HD (Heavy Duty) Oil helps hugely by its extra lubricating and motor-cleansing powers. Proof? Try it—QUAKER STATE HD—*"It's the OIL that Carries the Load!"*

Quaker State HD Oil
for your trucks, buses and tractors

Pledged U.S. TRUCK CONSERVATION CORPS

Quaker State Motor Oil
for your passenger cars

QUAKER STATE HD OIL

AND QUAKER STATE SUPERFINE LUBRICANTS

QUAKER STATE OIL REFINING CORPORATION • OIL CITY, PA.

A dinner in The Stevens Hotel terminated the First Annual Lindsay Structure Truck Body Distributors Conference, held in Chicago April 25-27. Represented were: American Body & Equipment Co.; Armor Insulating Co.; Auto Body Works; Auto Truck Equipment Co.; John Broenen & Co.; Carnegie Body Co.; City Auto & Body, Inc.; Cliffside Body Corp.; Erlinder-Platt Corp.; Gardner Equipment Co., Ltd.; Hercules Body Sales Co.; Lewisohn Sales Co.; McCabe-Powers Auto Body Co.; Middlekauff, Inc.; R. P. Olsen & Son; Ray Roberts; Smith Commercial Body Works; Transport Bodies, Inc.; Truck Body Industries; Watkins Body Corp.; and Peter Wendel & Sons

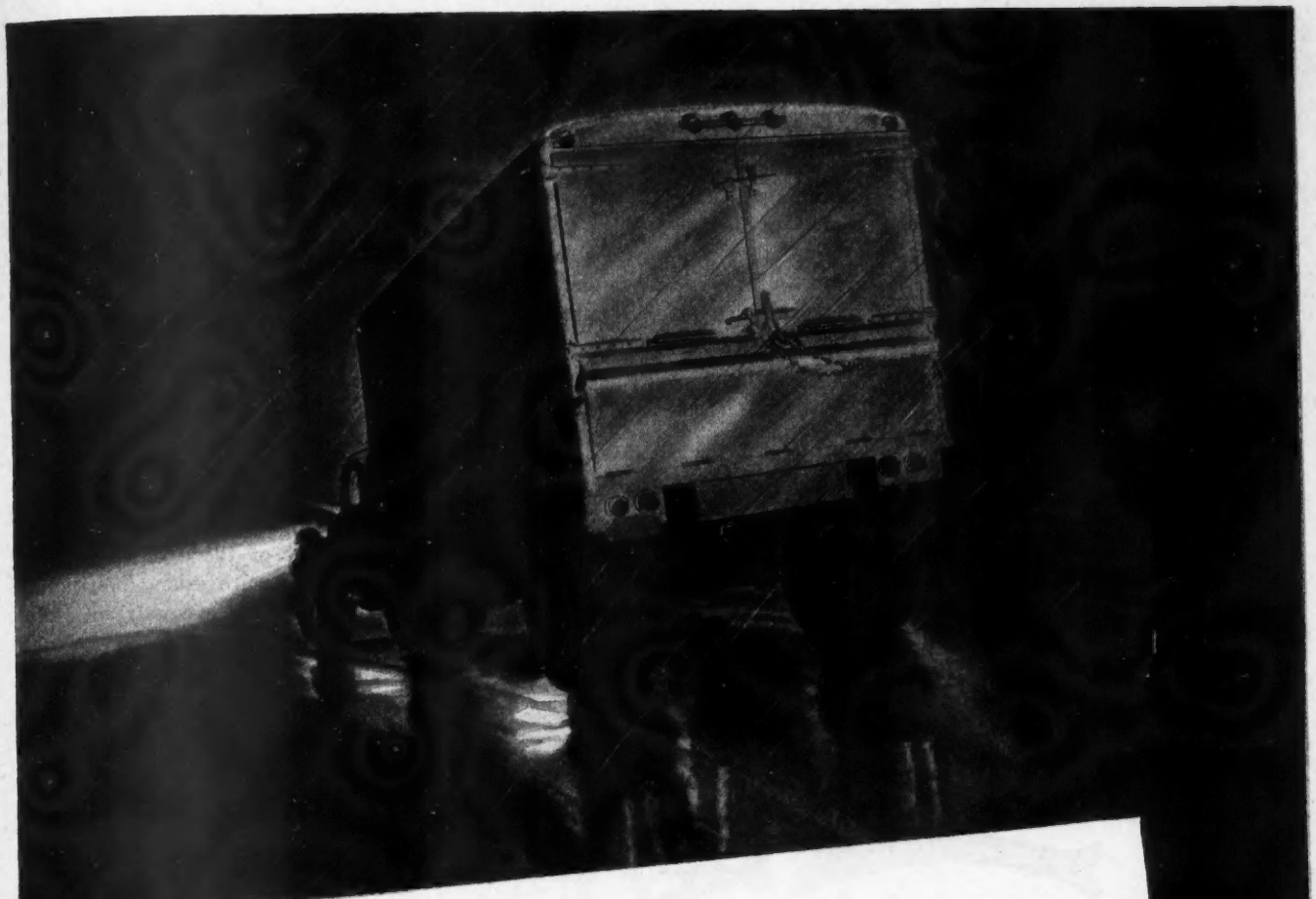
Large Fleets Tending to Consider Overall Economy

Ways and means of expediting vitally needed equipment to commercial truck operators was the topic discussed by truck body manufacturers from coast to coast who met in Chicago April 25, 26 and 27 for the Lindsay Structure Truck Body Distributors' Conference.

In a talk to the distributor organization, Owen S. Lindsay predicted that trucking will figure as one of the major industries in post-war America.

"When we stop to consider that the United States covers an area of nearly four million square miles," said Mr. Lindsay, "it becomes readily apparent why the flexibility of operation unique to trucks and trailers makes them an essential part of the American transportation system. There is no question but that the service afforded by the trucking industry has contributed substantially toward the great industrial growth of the United States during the past 15 years. We have all seen the magnificent part trucking has played in

(Turn to Page 186, Please)



CEILING ZERO.. VISIBILITY GREAT

WITH K-D LIGHTING ON THE JOB

● A lot depends on safety lighting when weather is heavy and pavements are slick. That's why so many fleet owners insist on K-D Lighting for maximum safety, for dependable performance under every driving condition.

Twenty-five years of lighting service has given K-D the reputation for durability, dependability, economy and *safety*. K-D engineers are experts on every phase of lamp manufacture—design, materials, visibility and legal requirements.

See the complete K-D line at "Lighting Headquarters." Your K-D Jobber is equipped to handle every lighting problem with the *right light for the right job at the right price.*

THE K-D LAMP COMPANY, CINCINNATI, OHIO

K-D LIGHTING

The Right Light for the Right Job

(CONTINUED FROM PAGE 184)
maintaining that activity for the war effort and we can expect it to play just as important a part in our national activity after the war.

"We must bear in mind, however," pointed out Mr. Lindsay, "that many innovations made by truckers under stringent wartime conditions have resulted in more efficient methods of operation and will, therefore, be carried over to peace time. This will result in a demand for more specially engineered equipment than in pre-war days. Also, there is growing evidence of a strong tendency on the part of large fleet operators to consider new equipment primarily from the standpoint of over-all operating economy. This means that in the future, entire fleets will be scientifically engineered to meet the individual hauling needs of the large operators. If we are to render a professional service to the trucking industry then we must be prepared to meet these demands."

One of the highlights of the conference was an engineering clinic at the Lindsay and Lindsay plant. Here the distributor organization received detailed information on the many new improvements which have been made in Lindsay Structure bodies since the start of the war and how these improvements will enable the Ls distributor to give his customers not only better equipment but also faster service.

An allotment of steel for truck bodies just granted to Lindsay and Lindsay will permit the company's national distributor organization to start supplying a limited number of bodies to commercial operators by the latter part of June. An equitable distribution of the company's allotment will assure each distributing area throughout the country of a pro-rata share of bodies both for new chasses and to rehabilitate old chasses.

Marmon-Herrington Sponsors English-Chinese Dictionary

Recognizing the increasingly important part that transportation will play in the industrial and cultural development of post-war China, the Marmon-Herrington Company, of Indianapolis, Ind., has made a substantial contribution to a better understanding between the Chinese and American peoples by underwriting the preparation of an English-Chinese automotive dictionary. Its 252 pages list almost 10,000 automotive and related terms and phrases, with their Chinese equivalents. It will prove particularly valuable to the military forces operating in China while the war continues, and to governmental and civilian transportation organizations in the reconstruction period when peace returns. At the same time it will serve the interests of the entire automotive industry of America and should be helpful in promoting an expanded automotive trade between China and the United States.

Dr. George E. Hulse, of U. S. Rubber's Passaic, N. J. laboratory, has been appointed research director of National Battery Co.'s Gould commercial division at Depew, N. Y.

MOTOR RYTHM

MAKES THAT ORNERY ENGINE BEHAVE

CHEMICAL engine-cleansing and carbon-removal is the modern way to rid engines of power-wasting deposits of carbon, gum, sludge, and varnish. That's why leading truck, bus, and cab fleets use MOTOR RYTHM regularly.

MOTOR RYTHM is a chemical compound developed in the famous Hollingshead laboratories. Added to gasoline and oil, it frees sticking valves and rings . . . stops bucking and ping due to carbon . . . guards engines against internal rust and corrosion.

Use MOTOR RYTHM in every unit *regularly* to keep the engine clean! Your engines will have more power and pep . . . use less gasoline and oil . . . cost less to maintain. You'll cut wasteful down-time and get the maximum from your equipment and manpower. *R. M. Hollingshead Corporation, Camden, New Jersey; Toronto, Canada.*

BUY MORE BONDS

Hollingshead

LEADER IN MAINTENANCE PRODUCTS

Write for information on other WHIZ fleet reconditioning and maintenance products:

HO-ZOF DEGREASING COMPOUND • BRAKE FLUID • RUST PREVENTIVE • COOLING SYSTEM CLEANERS • SHOCK ABSORBER FLUID

Personnel Changes

Allen L. Struble has been appointed vice-president in charge of sales of the Trailer Company of America, Cincinnati, Ohio, succeeding M. N. Terry, resigned. Mr. Struble formerly was with Fruehauf and Reo.

The General Tire & Rubber Co. announced the following field promotions: Ward A. Morse, Kansas City branch manager, has been appointed Southwestern division manager; L. L. Higbee, store manager at Billings, Mont., is Kansas City branch manager; A. B. Nichols, territorial representative in Jackson, Miss., has been named Dallas branch manager; John S. Walker, who has represented General in the San Antonio area is manager of the reopened Memphis branch; Harry Whitesell, Oklahoma territorial representative, is manager of the new branch established in Houston.

L. C. Hatch has been named manager of the winch and crane division of Gar Wood Industries, Inc., to succeed G. E. Robinson, retired.

James C. Hendrickson has been appointed general sales manager of the International Chain & Mfg. Co., York, Pa.

George W. Mathews, New York district manager for Brunner Mfg. Co., who has been operating from temporary quarters since his recent appointment, now is permanently located at 340 W. 57th St., N. Y. C.

R. E. Busey, research engineer, has been named development engineer of The White Motor Co., succeeding Roger Weider recently promoted to executive bus engineer.

L. W. Kinney, project engineer, has been appointed field research engineer for The White Motor Co.

R. P. Exten joined the Young Radiator Co., Racine, Wis., as executive assistant to the president.

Ray D. Mains, who for the past year has been in the Fruehauf Trailer Co.'s Washington office as special assistant to Roy A. Fruehauf, executive vice president, returned to the Chicago branch as sales manager.

Edward V. Creagh has been appointed advertising and sales promotion manager of American Chain & Cable Co., Inc., and Associate Companies, Bridgeport, Conn.

(Turn to Page 192, Please)

Thomas W. Flood, assistant sales manager of Auto-Lite's original equipment division, has been promoted to sales manager of that unit

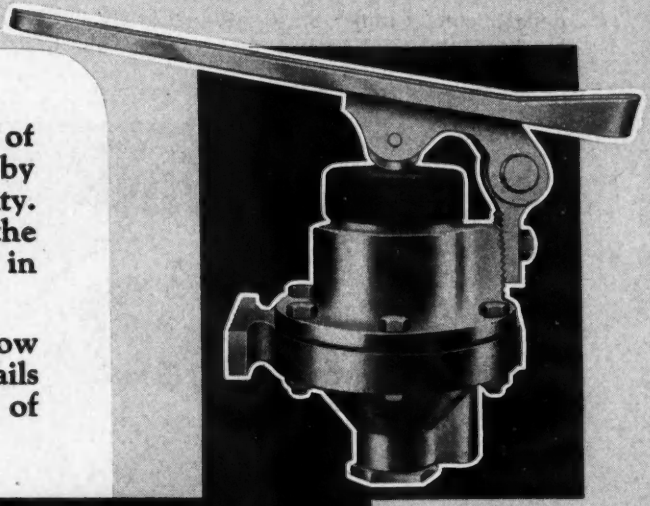
V. P. Bresan, with R. M. Hollingshead Corp. since 1934, has been appointed assistant sales manager of the Whiz Automotive Division

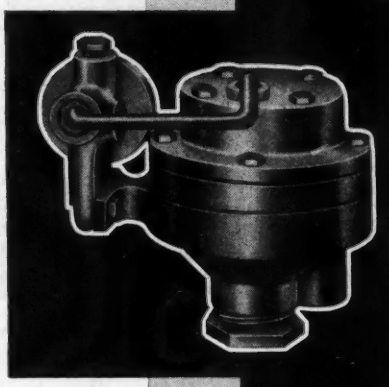
are blazing new trails in POWER CONTROLS

UNDER the rigorous, exacting requirements of military aircraft, power controls developed by AAC engineers have proven their superiority. In all the theaters of war, from Alaska to the African deserts, they have set new records in performance and dependability.

With the background of this war-tested "know how", AAC engineers are now blazing new trails in the development of many other types of engineered power controls—hydraulic, air, vacuum and electric. Tomorrow's trucks, trailers and buses . . . marine craft . . . Diesel and gas engines . . . airplanes . . . industrial machinery and equipment . . . will be equipped with these controls, to make operations easier, safer, more efficient and more economical.

AAC engineers are at your service, to help you with your own power controls problems now or after the war. Just ask for an AAC POWER CONTROLS ENGINEER. And write for further information concerning our new air brake equipment and other AAC *engineered power controls.*

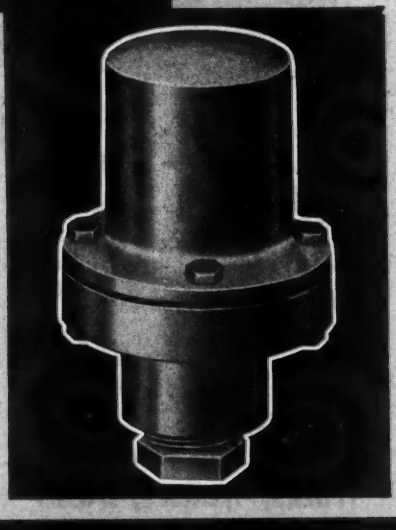




{Above} Treadle Type Air Brake Valve.

{Left} Relay Emergency Air Brake Valve.

{Below} Finger-tip Trailer Brake Control.



POWER CONTROLS DIVISION

BURBANK, CALIF.

(P-64)

ACCESSORIES CORPORATION

CONTROLS • PRECISION RADIO and ELECTRONICS

N. Y. Kansas City, Kans. Cable Address: AACPRO

PERSONNEL CHANGES

(CONTINUED FROM PAGE 188)

The Goodyear Tire and Rubber Co. announced several changes in the Akron tire department divisions. Carl A. Crafts, formerly manager of the tire retreading and repair division, has been appointed manager of the dealer division. Julian J. Wilson, a member of the tire retreading and repair division staff, now heads the department. Frank S. Griesinger, head of the dealer department, is manager of tube and Life Guard sales. William A. Kemmel, Los Angeles district manager, was transferred to Akron as manager of the truck tire division, replacing Frank N. Thomas, who is on a leave of absence. Clair L. Metzger has been named manager of the tractor tire division, formerly a part of the truck tire division.

The following changes have been announced by The Electric Auto-Lite Co. of Toledo: Floyd R. Stevenson has been appointed sales supervisor for the merchandising division; O. D. Spann has been named manager of the Oklahoma City district of The Auto-Lite Battery Co.; James W. Fairbanks, district supervisor of Auto-Lite's western division since 1936, has been advanced to central division manager with headquarters in Chicago; Kenneth B. Woyame has rejoined Electric Auto-Lite as district supervisor in the New York metropolitan area; William L. Wilson has been named district supervisor of the New England states.

J. E. Mayl, vice president of The Goodyear Tire & Rubber Co., Inc., whose headquarters were in Los Angeles, Cal., returned to Akron to head the company's tire sales division

Wilbur G. Perriguey, formerly technical consultant to the fuel and lubricants section of the Ordnance Department in Washington, joined the engineering division of the Standard Coil Co. of New Jersey as automotive fleet engineer in the fuel and lubricants section at 26 Broadway, N. Y. C.

H. G. Shaugnessy, midwestern automotive manufacturer's representative, has just opened a new warehouse in Minneapolis, where, among

(TURN TO PAGE 196, PLEASE)

C. C. Osmun, manager of Goodyear's tire departments, has been appointed manager of trade relations with tire industry and government rationing and pricing agencies

Hector Rabezzana, chief engineer, spark plug department of AC Spark Plug division of General Motors, retired due to ill health after serving AC for 28 years

PERSONNEL CHANGES

(CONTINUED FROM PAGE 192)

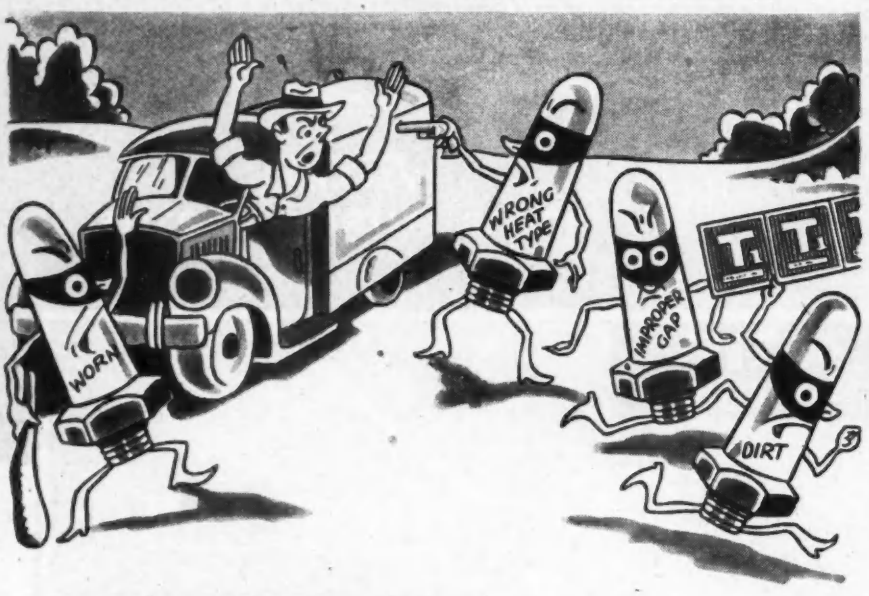
other well-known lines he will carry Maremont Terne-plate mufflers and alloy steel springs.

Elmer A. Muhs, formerly War Housing Center manager in Reading, Pa., has been appointed manager of purchases and priorities for Bowers Battery and Spark Plug Co., Reading.

Harold Brayman was appointed director of the public relations department of E. I. du Pont de Nemours and Co., Wilmington, Del., to succeed the late Theodore G. Joslin.

H. G. Harper is manager of The Goodyear Tire & Rubber Co.'s associated merchandise sales, including car and home supplies and the battery and brake department.

Norman E. Clock, formerly casting director for Paramount Pictures on the Pacific coast, has been appointed personnel manager for the Bowers Battery and Spark Plug Co., Reading.



Eugene W. Wasielewski has been appointed chief engineer of McCulloch Engineering Corp., a Borg-Warner industry, to further the development and application of superchargers

Carl Crafts, former manager of The Goodyear Tire & Rubber Co.'s dealer department, now is manager of the retail stores.

William P. Headden has been appointed assistant manager of the sales engineering department of the Standard Oil Co. of New Jersey. He has been supervisor of the fuels and lubricants section of the division.

Bill Lindseth has been appointed sales representative in the Minneapolis territory of The AP Parts Corp., Toledo, Ohio.

Leon Wellington joined the sales force of Thomas A. Edison, Inc., Kearney, N. J. (Emark Plant No. 1). Following a preliminary training period, he will be placed in charge of Edison-Emark battery sales in the metropolitan New York and Connecticut areas.

The Haskelite Mfg. Corp., Grand Rapids, Mich., announced two changes in its sales department. Davis C. Greene, for 10 years in the Detroit sales office, has been appointed St. Louis representative. Robert Burkhead, formerly of the production department in Grand Rapids, will replace Greene in the Detroit office.

Horine Leaves WPB

Merrill Horine has left the Automotive Division of WPB, where he served as automotive consultant, and taken up his duties with the Mack company, Long Island City, N. Y.

D. R. Mackenroth, manager of Goodyear's retail stores, includes supervision of associated merchandise in his new assignment


Dayton Thorobred

Dodge Resumes Civilian Truck Production

While production of Dodge army trucks continues at the scheduled rate, the Dodge Division of Chrysler Corp. announced that limited production, under governmental order, of new 1944 commercial trucks began April 3.

The new Dodge Job-Rated trucks will be sold to essential users by the nation-wide Dodge dealer organization on an ODT priority basis.

Three models are available in the 1944 line: 1½-ton conventional, 1½-ton c.o.e. and 2-ton conventional, with a choice of two wheelbases in the 1½-ton conventional model. All three models will be available in chassis and cab; in addition, a 12-ft. stake body will be available on the 1½-ton truck with 160-in. wheelbase.

Commenting on the 1944 commercial trucks, which are the first to be built since April, 1942, L. J. Purdy, general manager of the Dodge Truck Division, said:

"Although basically the new trucks are of the same design as the 1942 pre-war models, a number of improvements, permissible under WPB material allotments, have been made. The improvements include heavier transmission, universal joint, and propeller shaft; increased braking area; the addition of several engine accessories as standard equipment; changed position of the steering column to provide more room in the cab.

Large Transmission

The new Dodge truck four-speed transmission is larger and heavier, resulting in greater load carrying capacity. New engineering principles provide a better oil seal.

The changed position of the steering column provides more room from the column to the seat cushion and places the steering wheel at a more comfortable angle for the driver. The seat is designed for greater adjustment, forward and backward, than was provided in 1942 models.

Capacity of the oil bath air cleaner has been increased from one pint to one quart. She speedometer cable now is on the inside of the instrument panel, which reduces possibility of breakage. Frame reinforcements, commonly called "fish plates," are supplied on most models. All steering wheels are made of tenite, a plastic material. There are double wrapped eyes in the springs of all conventional models. A dome light in the cab, arm rest for the driver and two long arm adjustable rear vision mirrors are deluxe features.

1½-Ton Features

Improvements listed above apply to the entire 1944 line. In addition, Dodge announced the following features will be included on the new 1½-ton trucks: larger clutch, springs and tires, heavy duty oil filter with replaceable element, governor and auxiliary springs. Frictional area of the clutch has been increased from 100.53 to 131.14 sq. in.

Braking area on the new 1½-ton Dodges has been increased from 259.6 to 284.3 sq. in. and a brake booster is included on all except the 160-in. wheel base model, on which the booster is optional. Braking efficiency is claimed to be further improved by a larger bore in the master cylinder.

Battle-front Refrigerators

ON WHEELS!

Acme Photos

Sgt. E. P. Golomski of Milwaukee, Wis., and Pvt. C. Lucas of Hammond, Ind., at the controls of the Waukesha Engine-Driven Refrigeration Unit

● It isn't *always* K rations up at the front lines. Not when these G. I. refrigerators go rolling along. Here are some of them on the move in the European area.

No matter how long the supply line to the front may be, their loads of fresh meat and green vegetables, life-saving blood plasma and other precious medical stores will arrive in prime condition. The Waukesha Engine-Driven Refrigeration Unit takes care of that. Dependability is built in—and how well Waukesha *knows how* to build it in.

Waukesha *know-how* was gained from years of building mobile engine-driven air conditioning and refrigeration equipment. Equipment that proved its dependability over millions of railway and highway miles—despite constant variation, sudden changes and wide extremes of temperature.

Today all Waukesha *know-how* goes into the war effort—and all Waukesha production goes to the armed forces. After the war Waukesha mobile engine-driven refrigerating units . . . still further proved *and* improved . . . will be ready for mobile commercial applications of every type.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. • NEW YORK • TULSA • LOS ANGELES

MORE POWER FOR VICTORY

WAUKESHA ENGINES

Recap Supervisors Named

Appointment of six regional supervisors for recap plant operations of The B. F. Goodrich Co. are announced by E. E. Arrington, manager of recap plant operations. They are:

E. F. Cavanaugh, New York, Albany, Philadelphia, Washington districts, headquarters, New York City; Sigmund Uyldert, Buffalo, Cleveland, Pittsburgh districts, headquarters, Akron; M. W. Platt, Minneapolis, Omaha, Kansas City and Denver districts, headquarters, Omaha; C. R. McEntire, Charlotte, Atlanta and Jacksonville districts, headquarters, Atlanta; P. C. Ickes, Los Angeles, San Francisco and Seattle districts, headquarters, Los Angeles; and L. F. Sonderman, Detroit, Cincinnati, Chicago, Memphis and St. Louis districts, headquarters, St. Louis.

Kingham Makes Changes

The Kingham Trailer Co., Louisville, Ky., has made the following changes: John B. Kingham promoted to first vice-president and general manager; O. H. Kingham, formerly sales manager, advanced to second vice-president and assistant manager; E. J. (Luke) Lucas now sales manager and E. H. Cosgrove in charge of engineering and priorities.

Under the new set up C. H. Kingham remains as president of the company and Celia M. Lipsey will continue as secretary-treasurer.

Training Film Catalog Available

A catalog of one manufacturer's 1944 motion picture film releases is available to fleet operators. It describes the various 16 and 35 mm. sound films which are loaned without charge, except transportation costs.

While prepared principally for general industrial distribution, there are several films that should be of interest to fleet maintenance men. These deal with the machining, riveting and welding of aluminum.

If you can supply your own sound film projector, and are interested in aluminum fabrication, write L—— on the free postcard for copy of this catalog.

BROTHER, TO GET OUT OF HERE TAKES POWER!

The Zenith Carburetor is a member of "The Invisible Crew"—precision equipment which more than 30 Bendix plants are speeding to world battle fronts.

Zenith Carburetors Give Your Trucks This STAMINA!

Keep the "big boys" on the job . . . the husky, hauling monsters that deliver the goods to wherever they must go! Nothing but peak efficiency will do.

In these days it's both *smart* and *patriotic* to depend upon Zenith Carburetor Authorized Service Stations to keep your Zenith Carburetor in perfect condition. Expert carburetor servicing by trained men, with the right tools and precision equipment for inspecting carburetors, plus the will to do a thorough job for you . . . all are at your command.

"ZENITH" is a trademark of Bendix Aviation Corporation

THE INVISIBLE CREW
Precision Equipment by Bendix Aviation Corporation

LOOK FOR THIS SIGN!
It is your assurance of fine workmanship, quality repair parts and lasting satisfaction.

ZENITH CARBURETOR AUTHORIZED SERVICE

ZENITH CARBURETOR DIVISION, Detroit, Michigan

Topics of Current Interest on SAE T & M Program

A program filled with discussions of practical value to men in charge of truck fleets has been prepared for the S.A.E. Transportation and Maintenance Meeting at the Bellevue-Stratford Hotel in Philadelphia, Pa., June 28 and 29. Subjects and speakers are as follows:

"Trucks as of 19—" by B. B. Bachman, vice-president in charge of Engineering, The Autocar Co.

"Hot Engine Sludge and Its Control" by H. C. Mougey, Research Laboratory Division, General Motors Corp.

"Cold Engine Sludge and Its Control" by B. E. Sibley, Continental Oil Co.

"Filters and the Sludge Problem" by E. G. Gunn, Fram Corp.

"Factors of Design and Construction Affecting Cooling System Maintenance" by B. H. Green, National Carbon Co., Inc.

"What Truck and Bus Operators Should Know About Synthetic Tires" by J. E. Hale, Firestone Tire & Rubber Co.

"Employment of Electronics for Effecting Tire Vulcanization" by Lieut. Col. C. W. Vogt, chief, Technical Staff for Supply, Transportation Corps, War Department.

At the June 28 banquet ODT Director Col. J. Monroe Johnson will be the principal guest speaker and H. H. Kelly, of the ODT, will act as toastmaster.

Bendix-Westinghouse Makes Appointments

R. L. Morrison, vice president and general manager of the Bendix-Westinghouse Automotive Air Brake Co., has named E. R. Fitch, director of engineering; A. R. Leukhardt, chief engineer; F. L. Wheaton, director of sales; A. V. Howe, sales manager; S. Johnson, Jr., manager sales engineering; H. W. Jackson, service sales manager, and M. S. Stein, auditor. All individuals mentioned in these appointments are of long standing within the Bendix-Westinghouse organization and are widely known in automotive circles. In addition to this group, L. R. Barton, a comparative newcomer in the Bendix-Westinghouse family, has been named to head the expediting and priority departments.

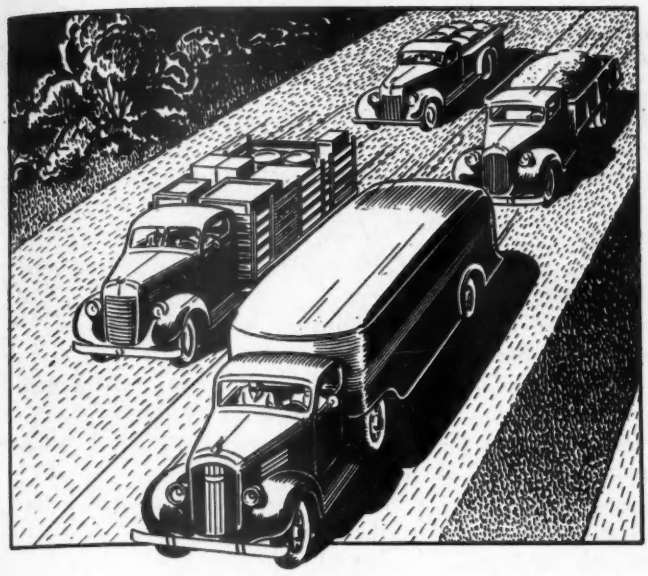
Data from Conference on Cleaning Available to Fleets

Concurrently held in New York, Chicago and Los Angeles were the Oakite Third War Production Conferences on cleaning, de-scaling, de-rusting, de-greasing and related production and maintenance operations. Participating with the entire Field Technical Service Representatives were the staffs of the Mechanical Engineering, Chemical and Research Laboratories and General Headquarters of Oakite Products, Inc.

These two-day sessions were devoted to the collating of field experience in order to determine the best and most practical methods for stepping up wartime production through speedier cleaning, due consideration being given to the emergencies of manpower and the shortage of time. Also discussed were concrete, workable techniques for prolonging equipment life; improving plant sanitation and maintenance; faster, more thorough cleaning in repair and overhaul procedures.

Of particular interest to truck and bus fleet operators were the information and data exchanged by the Technical Service Representatives revealing time and effort-saving techniques on such maintenance, repair and overhaul work as de-greasing parts to simplify inspection and expedite repair and overhaul; steam-detergent cleaning of motors and chassis; stripping bodies before repainting; conditioning radiators and cooling systems; cleaning and deodorizing bus and truck interiors; cleaning used spark plugs before reconditioning and reclaiming; keeping garage floors and pits grease-free.

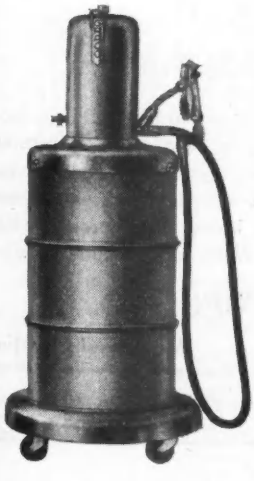
Data and information resulting from the discussions are freely available to all.



GREASE
keeps 'em moving

The merchandise of the nation flows in steady streams of traffic on the broad highways—by means of motor transportation that brings service right to our doors. Yet it would cease to flow if it were not for one thing—*grease*. For it is lubrication that keeps the wheels turning; that keeps trucks moving.

Graco lubricating equipment is your assurance against lost time when your trucks need servicing. And you can be sure of having not only the right grease in the right place at the right time, but that it will be applied at the right pressures.



● Here shown is the Graco air operated 100 lb. pressure chassis lubricator, ideal for general lubricating. It has a 36-1 ratio pump and is equipped with six-foot extreme pressure hose, control valve, swivel, air line coupler, 8″ hydraulic adapter and 7″ needle adapter. If higher pressure is needed, it can be furnished with 50-1 ratio pump and super charger. Truck, dolly or stationary models are available. Write for Graco catalog No. A119.

GRACO PRODUCTS

GRAY COMPANY, INC.
MINNEAPOLIS, MINNESOTA

PIERCE GOVERNORS

Made by the world's largest governor manufacturer, Pierce Flyball Governors are mechanical in operation, positive and unfailing in action. Precision manufacture gives close, accurate regulation; sturdy construction assures long, trouble-free service. For complete information on Pierce Governors, please write, giving make and model of engine powering your equipment.

★

THE PIERCE GOVERNOR COMPANY, INC.
1611 OHIO AVENUE • ANDERSON, INDIANA

Canadian Manufacturer and Distributor:
Burlec Limited, Toronto 13, Canada

Manufacturers of Pierce Precision Governors and Sisson Automatic Chokes

Truck Users Among 15 Chosen Manpower Groups

War Manpower Commission regional directors' designation of certain trades and services as "locally needed" activities will hereafter be restricted to those in a list of 15, WMC announced today. Designation of any unlisted activity will be made only after review by headquarters. The new arrangements will in no way change the responsibilities of field offices in the observance of existing standards for the designation of individual establishments as locally needed in the activities receiving these designations.

In its instructions to regional offices, WMC pointed out that "it is important that designations be made only when it appears that there might be a collapse of the services necessary for health, welfare and safety of an area and of the services necessary to the continuance of essential activities.

The effect of designating an activity as locally needed, it was explained, is to afford the employers the same opportunity to get their workers through the United States Employment Service as employers in essential activities have.

The approved list follows:

Wholesale distribution of automotive parts, supply and equipment.

Wholesale distribution of drugs.

Dry cleaning—wholesale and retail dry cleaning services.

Wholesale and retail distribution of seed, hay, and grain, and farmers' supplies.

Wholesale and retail distribution of foods.

Wholesale and retail distribution of fuel.

Hotels.

Wholesale and retail distribution of ice.

Laundries, power-driven.

Linen supply.

Wholesale and retail distribution of milk and dairy products.

Wholesale distribution of petroleum products.

Restaurants, cafeterias and industrial feeding services.

Taxicab operation.

Local cartage.

Phillips OPA Deputy Chief

OPA Administrator Chester Bowles has announced the resignation of Colonel Bryan Houston as Deputy Administrator for Rationing and the appointment of Charles F. Phillips as his successor, both changes effective May 15. Colonel Houston returns to military duty as a member of the general staff. Mr. Phillips has been Director of the Automotive Supply Rationing Division.

Fram President Dies

Harry T. Peters, president and comptroller of the Fram Corp., died April 23 at his home in Chevy Chase, Washington, D. C.

Mr. Peters for many years was associated with the Corby Baking Co., of Washington, and later became senior partner of Peters, Smith & Co., tax consultants, Washington. He became associated with Fram early in 1937 as comptroller and in July, 1942, became president of the concern, which manufactures oil filters.

Ted Rodgers' Son Recovers

Ted Rodgers, Jr., son of the president of the American Trucking Associations, Inc., is back on the job in his father's Scranton, Pa., truck operation, after a 30-month absence due to an automobile accident. His father gives penicillin credit for bringing about his recovery.

Draft Rules Eased

New Selective Service directive, Local Board Memorandum 115, as amended May 9 is of great importance to the trucking industry.

Trucking employees in two age classes are affected by the new regulations as follows:

MEN OVER 30 in essential industries, such as trucking, will be deferred from the draft "indefinitely"; that is taken to mean that they will not be called this year and possibly not for the duration. Unskilled men over 30 in essential industries also may be deferred now; they need not necessarily be "key men," as was required previously.

MEN 26-29. Drafting of registrant in this age group who are "necessary men" in essential industries is stayed "for the time being," which is interpreted to mean at least six months. "A registrant age 26 through 29," the memorandum states, "may be retained or placed in Class 2-A if he is found to be *necessary to and regularly engaged in* an activity in support of the national health, safety or interest." Motor carriers will have to continue to put up a fight to hold men in this age group, but it should be easier than before. The test of a "necessary man," says a State Selective Service officer, is whether or not the man can be replaced.

Local draft boards are directed to review 1-A's in both the 26-29 and 30-37 age groups and grant deferments in line with the broad new policies. Employers, however, should continue to file 42-A applications for occupational deferments and for continued deferments when existing deferments expire. If you have been seeking occupational deferment for a

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man 26-37 now classified 1-A, you should write to the local board and ask that the case be reopened in view of Local Board Memborandum 115, as amended May 9. Watch all these cases closely and appeal any adverse decisions.

Reason advanced by Selective Service for the liberalized orders is that there is enough manpower in the 18-25 group and among older men not engaged in essential work to meet present draft calls. If one board has to pass up its call, other boards may have enough men to meet the armed forces' needs. A local board, however, still has power to take a man, even if he is in an essential industry, if it believes he is not making the best use of his efforts in the war. However, addition of the words "national health, safety or interest" to activities entitled to deferments gives boards new latitude in making such decisions. This covers a much broader scope than the specific occupational bulletins 26-5, relating to trucking, and 26-7, relating to warehousing, which are still in effect.

Members also are advised to file Form 42-A for all men 18-37 who are disqualified for service (Class 4-F) or qualified for limited service only (Class 1-A-L). It is mandatory that this form be conspicuously marked "Qualified For Limited Service Only" or "Disqualified For Any Military Service." Such action may result in reclassification of such men as 2-A, listing men as engaged in essential activity and helping you to retain them in your employ.

New Dugas Distributor

Service and distribution in connection with Dugas fire extinguishers and dry chemical in the Montana and Wyoming districts will henceforth be handled by Ray Austin of Wyo-Mont Distributors, Billings, Mont., according to an announcement of the Dugas Engineering Corp., Marinette, Wis.

EASY TESTS FOR CHECKING BEARINGS

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Let stand for 30 seconds and, over the first drop, deposit a drop of No. 2 chemical.

If the bearing metal is a cadmium bearing alloy, the chemicals will develop a yellow color.

Tin base or lead base babbitts will show no reaction or color.

The chemicals will retain their strength for three months.

Lead Babbitt Test

This test will determine if the metal is a lead base babbitt, such as Bermax, SAE 13 or SAE 14, but will not distinguish differences between these babbitts. Two chemicals are required:

No. 1 Glacial Acetic Acid, 50% Solution

No. 2 Potassium Iodide, 20% Solution

Two medicine droppers are required; always use the same dropper for the same chemical.

Clean the surface to be tested of all grease, oil and oxides to reach clean metal and deposit a drop of the No. 1 chemical.

Let stand for 30 seconds and, over the first drop, deposit a drop of the No. 2 chemical.

If the bearing metal is a lead base babbitt, the chemicals will develop a yellow color.

Tin base babbitts, or cadmium alloys will show no reaction or color.

Nickel Content Test

The test procedure given by Cleveland Graphite Bronze identifies the cadmium-base alloys still more specifically. They point out that no simple test can differentiate between "cadmium-silver" and "cadmium-

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EASY TESTS

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nickel." Thus, if a small chip or scraping of cadmium-alloy is treated with "one to one" nitric acid and goes into solution completely, without precipitation, the alloy can be tentatively identified as cadmium-base. If desired, it should be further checked for nickel or silver content. The test for nickel is as follows:

Dissolve a small chip or place on drop of one to one nitric acid on a portion of the bearing and allow to stand one minute. Absorb the drop of solution on a piece of filter paper, add one drop of a 1 per cent alcoholic solution of dimethylglyoxime. A red color indicates nickel.

Silver Content Test

The test for silver is as follows:

Dissolve a small chip in one to one nitric acid, add one drop of salt solution (NaCl). A white precipitate indicates silver. NOTE: The acid and water used in checking bearings must be chloride free or otherwise silver will precipitate prematurely and the test will be misleading.

Special Markings

Cleveland Graphite cites some physical means of identifying certain types of bearings by their marking. "For instance, the Ford floating rod bearing will be cadmium base if the oil holes are staggered and will be either tin or lead base if the center line of the oil holes is parallel to the axis. Practically all of our tri-metal bearings have a small triangle stamped on the back. As far as we know, all Chevrolet bearings are lead base and most Chrysler bearings are either tin base or lead base. We do make a few tri-metal bearings for Chrysler. Ford is the only large user of cadmium bearings.

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General Motors Tests

Still another test procedure was worked out for this article by the General Motors Research Laboratories. This is a simple method of identifying the general class of "cadmium-base," "lead-base babbitt," and "tin-base babbitt." The same procedure is employed in each instance, using the same chemicals.

GMR recommendations:

1. Clean a small spot until bright, using a piece of fine emery.

2. Apply dilute hydrocloric acid (HCl), one part of acid to five parts of water, using a glass rod applicator.

3. Let acid etch for 10 minutes.

4. Then apply sodium sulfide on the etched spot.

Identification then is as follows:

1. Lead-base, spot will turn *black.*

2. Tin-base, spot will turn *brown.*

3. Cadmium-base, spot will turn *yellow.*

The foregoing gives the fleetman an option of one of three different methods of identifying "white" bearing alloys. We recommend that you select the one that seems best fitted in your case. It would be well to do some experimenting before reliance is placed upon the method you select.

The simplest way to do it is to pick out a group of sample bearings whose analysis is known beyond a doubt. Then apply your test method. See whether this gives you the right answer. You may have to make a number of trials before you are satisfied. But in any event, turn the job over to one man. Let him do the experimenting and let him acquire the necessary proficiency so that complete reliance can be placed upon whatever checking he does.

END

(Please resume your reading on P. 58)

ADVERTISERS' INDEX

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